

PURSUANT TO A.R.S. SECTION 38-431 THE GILA COUNTY BOARD OF SUPERVISORS WILL HOLD AN OPEN MEETING IN THE SUPERVISORS' AUDITORIUM, 1400 EAST ASH STREET, GLOBE, ARIZONA. ONE OR MORE BOARD MEMBERS MAY PARTICIPATE IN THE MEETING BY TELEPHONE CONFERENCE CALL OR BY INTERACTIVE TELEVISION VIDEO (ITV). **ANY MEMBER OF THE PUBLIC IS WELCOME TO ATTEND THE MEETING VIA ITV WHICH IS HELD AT 610 E. HIGHWAY 260, BOARD OF SUPERVISORS' CONFERENCE ROOM, PAYSON, ARIZONA.** THE AGENDA IS AS FOLLOWS:

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**WORK SESSION - TUESDAY, SEPTEMBER 25, 2012- 10 A.M.**

- 1 Call to Order - Pledge of Allegiance
- 2 Information/Discussion on the Arizona Public Service Energy Services Company, Inc.'s Energy Audit Report. **(Steve Stratton)**
- 3 Information/Discussion regarding funding changes to the immunization program to necessitate the development of a private vaccine program for the underinsured and insured pediatric population. **(Michael O'Driscoll)**
- 4 Information/Discussion/Action to formulate Gila County's list of issues/priorities to be presented at the County Supervisors' Association (CSA) annual summit on October 1-3 in Sierra Vista to be considered by Arizona's county supervisors for inclusion in CSA's 2013 Legislative Agenda.  
**(John Nelson)**

IF SPECIAL ACCOMMODATIONS ARE NEEDED, PLEASE CONTACT THE RECEPTIONIST AT (928) 425-3231 AS EARLY AS POSSIBLE TO ARRANGE THE ACCOMMODATIONS. FOR TTY, PLEASE DIAL 7-1-1 TO REACH THE ARIZONA RELAY SERVICE AND ASK THE OPERATOR TO CONNECT YOU TO (928) 425-3231.

THE BOARD MAY VOTE TO HOLD AN EXECUTIVE SESSION FOR THE PURPOSE OF OBTAINING LEGAL ADVICE FROM THE BOARD'S ATTORNEY ON ANY MATTER LISTED ON THE AGENDA PURSUANT TO A.R.S. SECTION 38-431.03(A)((3).

THE ORDER OR DELETION OF ANY ITEM ON THIS AGENDA IS SUBJECT TO MODIFICATION AT THE MEETING.

**Work Session****Meeting Date:** 09/25/2012**Submitted For:** Steve Stratton, Public Works Division  
Director**Submitted By:** Shannon  
Boyer,  
Executive  
Administrative  
Asst., Public  
Works Division  
  
**Division:** Administration**Department:** Public Works Division**Division:** Administration

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**Information****Request/Subject**

Arizona Public Service Energy Services Company, Inc. (APSES) Technical Energy Audit

**Background Information**

On April 5, 2011, the Professional Agreement No. 6557.102-12-2010 between Gila County and Arizona Public Service Energy Services Company, Inc. (APSES), was approved by the Board of Supervisors. This agreement allowed APSES to perform a technical energy audit of Gila County for a period of one year. After the audit was completed, APSES would provide an Energy Audit Report.

**Evaluation**

The audit has consisted of the collection of data, inspection of facilities, establishment of base year energy consumption, the performance of a financial analysis of energy conservation measures and the preparation of the detailed Energy Audit Report.

Staff will present a summary of the report for BOS discussion and a representative of APSES will be present to answer any questions.

**Conclusion**

The Energy Audit Report is 100% complete and was received by Gila County on July 17, 2012.

**Recommendation**

It is recommended that the Board of Supervisors receive the APSES Energy Audit Report with the understanding that staff will prepare a plan to fund and implement various energy saving measures over the next several years.

**Suggested Motion**

Information/Discussion on the Arizona Public Service Energy Services Company, Inc.'s Energy Audit Report. **(Steve Stratton)**

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**Attachments****APSES Energy Audit Report 7-16-12**

Executive Summary 4-5-11

Energy Audit Contract 4-5-11



## **INVESTMENT GRADE AUDIT 100% Review**



**Presented By:**



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**July 16, 2012**



# INVESTMENT GRADE AUDIT

## 100% REVIEW

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## 1.0 EXECUTIVE SUMMARY

Ameresco Southwest is proud to present our Investment Grade Audit (IGA) to Gila County. Ameresco Southwest has been tasked to deliver an IGA of 31 buildings selected by Gila County. The IGA is meant to provide a review of the Energy Conservation Measures (ECM) with Gila County and to communicate and obtain feedback on future deliverables.

The findings indicate there are significant energy and operational cost reduction opportunities at the selected buildings. By taking advantage of these opportunities, Gila County can positively impact their “Triple Bottom Line”. The Triple Bottom Line is a 21st Century concept, intended to capture a far greater breadth of criteria for measuring success, namely the economic, ecological, and social impacts of the project. By making the most of their Triple Bottom Line, Gila County can realize the largest savings opportunity, maximize their carbon footprint reduction and create the best environment for employees, visitors and residents.

This document is meant to provide a 100% review of the TEA progress to Gila County.

### INVESTMENT GRADE AUDIT PROGRESS

Since being selected, some of the advancements the Ameresco Southwest Team has made are as follows. It is as a result of this progress and the willingness and enthusiasm shown by Gila County that Ameresco Southwest can confidently say that the overall Audit is ‘on-target’.

- Completion of Mechanical System Auditing
- Completion of Lighting System Auditing
- Completion of Water System Auditing
- Development of Scope of Work Documents
- Site Visits and firm contractor pricing
- Integration of financial inputs and development of recommended measures

### 1.1. KEY MILESTONES

The findings from the Audit process indicate there are significant energy cost reduction opportunities, and subsequent pages will outline the findings to-date.

To ensure success, the following Table lists key milestones for the Investment Grade Audit process.

Table 1-0. Investment Grade Audit Key Milestones	
Key Milestones	Date
Audit Contract Approved	06.01.11
Project Review Meeting	10.14.11
Final Report Submittal	12.19.11
Final Report Update	07.16.12
Board Study Session	07.31.12
Board Approval	TBD
Finalize Contract Negotiations	TBD
Finalize Financing	TBD



## 1.2. POTENTIAL MAGNITUDE OF THE ENERGY COST REDUCTIONS

Depending upon the projects selected by Gila County and the term of the payback period, the utility cost reductions from the program are expected to be **19%** or greater annually, which will be used to substantially fund the debt service for the projects.

Based on the utility data provided for the baseline period of April 2010 – March, 2011, Gila County spends approximately \$484,300 for electricity, \$38,801 for natural gas and \$254,252 for water annually to support the building facilities included in this Audit. This figure also does not take into account any potential increases in electricity, natural gas or water spending which may result from any planned expansions or improvements. The preliminary findings have uncovered many potential areas for energy cost reduction opportunities. These cost reduction opportunities are estimated to save Gila County a significant amount of energy cost savings for the first year alone, based on the current costs of electricity, natural gas and water. It is this annual savings stream that creates the funding source used to pay for recommended upgrades and operational efficiency improvements for Gila County.

Assuming a straight-line utility cost escalation of just 3.1% based on NIST rate, the total savings over the 15 year project term are estimated to be **\$2,937,074**. The cost to implement specific upgrade and improvements measures will vary based on the scope of work that is mutually agreed to as more comprehensive analysis is performed throughout the Investment Grade Audit (IGA). Given the savings potential, the **15** year term, and an interest rate of approximately **3.25%**, this self-funding conservation program could pay for a **\$2,183,327** project that maintains an annual net zero cash flow. Additionally, this scenario does not include any additional funds or options used as a down payment, such as existing capital, grants, or stimulus funds that could be used to shorten the project term or increase the size of the project.

## 1.3. FINANCIAL

The purpose of the IGA is to evaluate current energy usage, and identify potential for improvements which form the basis of a fundamentally sound project. By identifying energy and water cost reduction opportunities, a program is specifically designed to assist Gila County in managing future utility and maintenance budgets, infrastructure improvements and equipment operations.

Ameresco Southwest will recommend a portfolio of cost reduction opportunities that produce a program requiring no capital from Gila County to implement. The annual savings stream creates the funding source that pays for the recommended upgrades and efficiency improvements for Gila County. Highlights of the program are summarized below:

- Estimated Annual Utility Savings: **\$ 150,660**
- 15 Year Project Savings: **\$ 2,937,074**
- Estimated Project Cost: **\$ 2,183,327**
- Estimated Potential Rebates: **\$ 88,323**



- Annual Lease Payment: **\$ 178,680**
- Financing Term Length: **15 Years**
- Approximate Annual Financing Rate: **3.25%**

Based on the accepted Rate Forecast, the following *Table 1-1* summarizes the savings potential of the recommended project.

Table 1-1. Proposed Annual Energy and O&M Savings			
Utility	Existing Annual Cost	Proposed Annual Cost Avoidances	Reduction (%)
<b>Electricity</b>	\$ 484,300	\$ 109,387	22.59%
<b>Gas</b>	\$ 38,801	\$ 8,476	21.84%
<b>Water</b>	\$ 254,252	\$ 32,797	12.90%
<b>Total Annual Cost Avoidance:</b>	<b>\$ 777,353</b>	<b>\$ 150,660</b>	<b>19.38%</b>

*Table 1-2 Project Cost & Savings Summary* displays the cost and savings associated with the implementation of the proposed energy performance contract project with Gila County.



Investment Grade Audit  
100% Review  
July 16, 2012

Table 1-2. Project Cost & Savings Summary											
Gila County Project Cost & Savings Summary											
Energy Conservation Measures		Potential Energy/Resource Savings							Potential Rebates		
ECM Number	ECM Description	Annual Electrical Consumption Savings (kWh)	Total Annual Electricity Savings kWh \$	Annual Natural Gas Savings (Therms)	Annual Natural Gas Savings \$	Annual Water Savings (Thousand Gallons)	Annual Water Savings \$	Total Cost Avoidance \$	Total Potential Rebates \$	All Inclusive Project Cost \$	Price Less Rebates \$
<b>TOTAL*:</b>		<b>844,102</b>	<b>109,387</b>	<b>6,799</b>	<b>\$8,476</b>	<b>3,179</b>	<b>\$32,797</b>	<b>\$150,660</b>	<b>\$88,323</b>	<b>\$2,183,327</b>	<b>\$2,095,004</b>
<b>Gila County Courthouse - 1400 E Ash St</b>		<b>218,767</b>	<b>\$ 37,856</b>	<b>(101)</b>	<b>\$ (128)</b>	<b>97</b>	<b>\$ 266</b>	<b>\$ 37,995</b>	<b>\$ 19,891</b>	<b>\$ 802,762</b>	<b>\$ 283,071</b>
001-01	Lighting/Lighting Controls	91,761	\$ 12,562	(438)	\$ (555)	-	\$ -	\$ 12,007	\$ 8,511	\$ 161,466	\$ 152,955
001-02	Water Retrofit	-	\$ -	337	\$ 427	97	\$ 266	\$ 693	\$ -	\$ 11,230	\$ 11,230
001-03	Direct Digital Controls	126,620	\$ 25,257	-	\$ -	-	\$ -	\$ 25,257	\$ 11,180	\$ 81,376	\$ 70,196
001-05	Economizer Retrofit	386	\$ 37	-	\$ -	-	\$ -	\$ 37	\$ -	\$ 48,691	\$ 48,691
<b>Gila County Sheriff and Jail - South 7th St</b>		<b>169,655</b>	<b>\$ 19,289</b>	<b>7,901</b>	<b>\$ 10,001</b>	<b>2,621</b>	<b>\$ 30,855</b>	<b>\$ 60,145</b>	<b>\$ 24,275</b>	<b>\$ 865,428</b>	<b>\$ 841,153</b>
002-01	Lighting/Lighting Controls	112,170	\$ 12,573	(536)	\$ (678)	-	\$ -	\$ 11,894	\$ 10,404	\$ 74,304	\$ 63,900
002-02	Water Retrofit	-	\$ -	723	\$ 915	2,621	\$ 30,855	\$ 31,769	\$ -	\$ 256,796	\$ 256,796
002-03	Direct Digital Controls	10,744	\$ 1,017	2,554	\$ 3,233	-	\$ -	\$ 127,964	\$ 6,270	\$ 127,964	\$ 121,694
002-04	HVAC Replacement	47,473	\$ 5,768	(527)	\$ (667)	-	\$ -	\$ 5,101	\$ 7,601	\$ 199,474	\$ 191,873
002-05	Economizer Retrofit	-	\$ -	-	\$ -	-	\$ -	\$ -	\$ -	\$ 15,554	\$ 15,554
002-06	Boiler Replacement	(731)	\$ (69)	5,366	\$ 6,792	-	\$ -	\$ 6,723	\$ -	\$ 129,217	\$ 129,217
002-07	DHW Replacement	-	\$ -	321	\$ 407	-	\$ -	\$ 407	\$ -	\$ 62,120	\$ 62,120
<b>Gila County Womens Dorm - South 7th St</b>		<b>16,254</b>	<b>\$ 1,898</b>	<b>(78)</b>	<b>\$ (98)</b>	<b>-</b>	<b>\$ -</b>	<b>\$ 1,800</b>	<b>\$ 1,508</b>	<b>\$ 21,372</b>	<b>\$ 19,864</b>
003-01	Lighting/Lighting Controls	16,254	\$ 1,898	(78)	\$ (98)	-	\$ -	\$ 1,800	\$ 1,508	\$ 21,372	\$ 19,864
<b>Juvenile Detention Center - 1425 South Street</b>		<b>31,419</b>	<b>\$ 3,829</b>	<b>(90)</b>	<b>\$ (114)</b>	<b>23</b>	<b>\$ 64</b>	<b>\$ 3,779</b>	<b>\$ 2,777</b>	<b>\$ 45,041</b>	<b>\$ 42,264</b>
004-01	Lighting/Lighting Controls	29,697	\$ 3,664	(142)	\$ (180)	-	\$ -	\$ 3,485	\$ 2,777	\$ 43,321	\$ 40,544
004-02	Water Retrofit	-	\$ -	52	\$ 66	23	\$ 64	\$ 130	\$ -	\$ 1,040	\$ 1,040
004-05	Economizer Retrofit	1,721	\$ 164	-	\$ -	-	\$ -	\$ 164	\$ -	\$ 681	\$ 681
<b>GuerreroComplex - 1400 E Ash St</b>		<b>13,600</b>	<b>\$ 1,776</b>	<b>135</b>	<b>\$ 171</b>	<b>23</b>	<b>\$ 64</b>	<b>\$ 2,011</b>	<b>\$ 1,616</b>	<b>\$ 95,735</b>	<b>\$ 94,119</b>
005-01	Lighting/Lighting Controls	7,138	\$ 962	(34)	\$ (43)	-	\$ -	\$ 918	\$ 667	\$ 10,235	\$ 9,568
005-02	Water Retrofit	-	\$ -	139	\$ 175	23	\$ 64	\$ 239	\$ -	\$ 2,703	\$ 2,703
005-04	HVAC Replacement	5,881	\$ 759	31	\$ 39	-	\$ -	\$ 798	\$ 949	\$ 75,563	\$ 74,614
005-05	Economizer Retrofit	581	\$ 55	-	\$ -	-	\$ -	\$ 55	\$ -	\$ 7,233	\$ 7,233
<b>CentralHeightsComplex - 5515 S Apache St</b>		<b>86,919</b>	<b>\$ 10,282</b>	<b>(183)</b>	<b>\$ (232)</b>	<b>5</b>	<b>\$ 12</b>	<b>\$ 10,063</b>	<b>\$ 10,676</b>	<b>\$ 194,439</b>	<b>\$ 183,763</b>
006-01	Lighting/Lighting Controls	43,798	\$ 6,010	(209)	\$ (265)	-	\$ -	\$ 5,745	\$ 4,062	\$ 104,976	\$ 100,914
006-02	Water Retrofit	-	\$ -	26	\$ 33	5	\$ 12	\$ 46	\$ -	\$ 520	\$ 520
006-03	Direct Digital Controls	45,121	\$ 4,273	-	\$ -	-	\$ -	\$ 4,273	\$ 6,614	\$ 88,943	\$ 82,329
<b>Fairgrounds (Exhibit Hall Only) - Hwy 60 Milepost 255</b>		<b>42,458</b>	<b>\$ 1,897</b>	<b>(133)</b>	<b>\$ (169)</b>	<b>67</b>	<b>\$ 182</b>	<b>\$ 1,911</b>	<b>\$ 1,859</b>	<b>\$ 85,145</b>	<b>\$ 83,286</b>
007-01	Lighting/Lighting Controls	42,458	\$ 1,897	(203)	\$ (257)	-	\$ -	\$ 1,641	\$ 1,859	\$ 77,450	\$ 75,591
007-02	Water Retrofit	-	\$ -	70	\$ 88	67	\$ 182	\$ 271	\$ -	\$ 7,694	\$ 7,694
<b>New Operations Facility - 725 N. Rose Mofford Way</b>		<b>3,058</b>	<b>\$ 403</b>	<b>(15)</b>	<b>\$ (18)</b>	<b>-</b>	<b>\$ -</b>	<b>\$ 385</b>	<b>\$ 284</b>	<b>\$ 5,196</b>	<b>\$ 4,912</b>
008-01	Lighting/Lighting Controls	3,058	\$ 403	(15)	\$ (18)	-	\$ -	\$ 385	\$ 284	\$ 5,196	\$ 4,912
<b>MichaelsonBuilding - 157 S. Broad St</b>		<b>37,473</b>	<b>\$ 4,941</b>	<b>(50)</b>	<b>\$ (63)</b>	<b>23</b>	<b>\$ 62</b>	<b>\$ 4,940</b>	<b>\$ 3,081</b>	<b>\$ 61,861</b>	<b>\$ 58,830</b>
009-01	Lighting/Lighting Controls	21,416	\$ 2,984	(102)	\$ (130)	-	\$ -	\$ 2,855	\$ 2,002	\$ 25,335	\$ 23,333
009-02	Water Retrofit	-	\$ -	53	\$ 67	23	\$ 62	\$ 128	\$ -	\$ 2,599	\$ 2,599
009-04	HVAC Replacement	3,276	\$ 737	-	\$ -	-	\$ -	\$ 737	\$ 529	\$ 23,891	\$ 23,362
009-05	Economizer Retrofit	3,130	\$ 299	-	\$ -	-	\$ -	\$ 299	\$ -	\$ 10,035	\$ 10,035
009-09	Programmable Thermostats	9,652	\$ 921	-	\$ -	-	\$ -	\$ 921	\$ 500	\$ -	\$ (500)
<b>PaysonComplex - 714 S. Beeline Ste. 2</b>		<b>56,483</b>	<b>\$ 7,510</b>	<b>(68)</b>	<b>\$ (216)</b>	<b>238</b>	<b>\$ 1,050</b>	<b>\$ 8,343</b>	<b>\$ 8,259</b>	<b>\$ 120,693</b>	<b>\$ 112,434</b>
010-01	Lighting/Lighting Controls	52,817	\$ 7,160	(252)	\$ (804)	-	\$ -	\$ 6,356	\$ 4,938	\$ 84,544	\$ 79,606
010-02	Water Retrofit	-	\$ -	184	\$ 587	238	\$ 1,050	\$ 1,638	\$ -	\$ 27,450	\$ 27,450
010-03	Direct Digital Controls	3,667	\$ 350	-	\$ -	-	\$ -	\$ 350	\$ 3,321	\$ 8,699	\$ 5,378
<b>Roosevelt Substation - Hwy 188, Milepost 243.3</b>		<b>41,583</b>	<b>\$ 4,085</b>	<b>-</b>	<b>\$ -</b>	<b>6</b>	<b>\$ 17</b>	<b>\$ 4,103</b>	<b>\$ 2,747</b>	<b>\$ 177,554</b>	<b>\$ 174,807</b>
011-01	Lighting/Lighting Controls	14,850	\$ 1,903	-	\$ -	-	\$ -	\$ 1,903	\$ 1,389	\$ 29,578	\$ 27,989
011-02	Water Retrofit	-	\$ -	-	\$ -	6	\$ 17	\$ 17	\$ -	\$ 728	\$ 728
011-03	Direct Digital Controls	17,884	\$ 1,081	-	\$ -	-	\$ -	\$ 1,081	\$ 1,358	\$ 40,875	\$ 39,517
011-08	VAV Retrofit	8,849	\$ 1,101	-	\$ -	-	\$ -	\$ 1,101	\$ -	\$ 106,573	\$ 106,573
<b>Payson Sheriff and Jail - 108 W Main St.</b>		<b>47,800</b>	<b>\$ 5,510</b>	<b>(195)</b>	<b>\$ (247)</b>	<b>29</b>	<b>\$ 84</b>	<b>\$ 5,347</b>	<b>\$ 4,434</b>	<b>\$ 81,066</b>	<b>\$ 76,632</b>
012-01	Lighting/Lighting Controls	47,800	\$ 5,510	(228)	\$ (289)	-	\$ -	\$ 5,221	\$ 4,434	\$ 47,580	\$ 43,146
012-02	Water Retrofit	-	\$ -	33	\$ 42	29	\$ 84	\$ 126	\$ -	\$ 3,327	\$ 3,327
012-07	DHW Replacement	-	\$ -	-	\$ -	-	\$ -	\$ -	\$ -	\$ 30,159	\$ 30,159
<b>Payson Public Works - 610 E Hwy 260</b>		<b>19,620</b>	<b>\$ 2,622</b>	<b>(52)</b>	<b>\$ (66)</b>	<b>48</b>	<b>\$ 140</b>	<b>\$ 2,696</b>	<b>\$ 1,835</b>	<b>\$ 40,539</b>	<b>\$ 38,704</b>
013-01	Lighting/Lighting Controls	19,620	\$ 2,622	(94)	\$ (119)	-	\$ -	\$ 2,503	\$ 1,835	\$ 35,028	\$ 33,193
013-02	Water Retrofit	-	\$ -	42	\$ 53	48	\$ 140	\$ 192	\$ -	\$ 5,511	\$ 5,511
<b>Payson Transportation Dept - 109 W. Frontier</b>		<b>57,013</b>	<b>\$ 7,488</b>	<b>(272)</b>	<b>\$ (345)</b>	<b>-</b>	<b>\$ -</b>	<b>\$ 7,144</b>	<b>\$ 5,331</b>	<b>\$ 86,497</b>	<b>\$ 81,166</b>
014-01	Lighting/Lighting Controls	57,013	\$ 7,488	(272)	\$ (345)	-	\$ -	\$ 7,144	\$ 5,331	\$ 86,497	\$ 81,166

\*Building/Location Totals appear in gray field.



## 1.4. CONCLUSION

The findings at this 100% mark indicate there are significant opportunities to conserve utility costs and reduce the carbon footprint in many of Gila County's facilities. This program will facilitate the operation of Gila County facilities in the most energy efficient manner. The program will provide the following benefits:

- Capital improvements in a self-funding financial program
- Replacement of aging mechanical infrastructure
- Improved comfort and employee work environment
- Create a mechanism for energy policy accountability
- The implementation of the Facility Automation System (controls)



## 2.0 INVESTMENT GRADE AUDIT OVERVIEW

Gila County has identified 31 buildings, totaling over 210,000 square feet to be included as part of this Audit. The buildings range in age from new to 82 years old. Although many of the older facilities have periods of renovation and upgrades throughout the years, many opportunities remain for further energy and efficiency improvements.

The purpose of the Investment Grade Audit is to ensure a fundamentally sound project. Through detailed technical evaluation and analysis, the Audit identifies energy and water cost reduction opportunities and determines the potential value thereof to maximize facility infrastructure improvements. The team worked with Gila County to reconcile any long term plans for use of the facilities with the proposed retrofit projects, other planned projects, compliance with local, State and Federal requirements, as well as, minimizing disruption to occupants during data collection and facility monitoring. During this time, Ameresco Southwest, in conjunction with Gila County's facilities team, evaluated numerous projects and subsequently selected a portfolio of projects that provided the best value to Gila County.

The Investment Grade Audit was designed to accomplish the following:

- Evaluate facility energy using equipment at 31 buildings.
- Provide recommendations to substantially reduce electric, natural gas and water use.
- Replace old and obsolete equipment with the most cost effective, long term solution.
- Standardize energy efficient products across all facilities.
- Make improvements to the environment that positively affect comfort, lighting levels and the health of employees, visitors and residents.
- Locate alternative funding sources to help pay for the improvements.

Ameresco Southwest is currently in the 100% Review Phase of the Investment Grade Audit, designed to develop operational cost savings measures for Gila County. The results of the Investment Grade Audit at this stage indicate that Gila County will realize a total annual cost avoidance of **\$150,660**. The cost of the improvements is **\$2,183,327**, providing a **14** year payback. The project will be structured to be 100% self-funding from reductions in existing operating budgets. These reductions, guaranteed by Ameresco Southwest, are used to cover the cost of the improvements plus finance costs over the 15 year term.

Gila County will realize a carbon footprint reduction by implementing projects that reduce fossil fuel consumption. Less energy consumed translates directly into a reduction in power plant production and resulting pollution released into the air. The energy cost avoidances for electricity, natural gas and water for the proposed project have been calculated and their environmental benefit recorded in *Section 6.0 Environmental Benefits*.

- **Electricity Reduction:**      **844,102** kWh/year (**23%** Reduction)
- **Natural Gas Reduction:**    **6,799** therms/year (**22%** Reduction)
- **Water Reduction:**          **3,179** thousand gallons/year (**13%** Reduction)



## 3.0 UTILITY ANALYSIS

A utility billing analysis provides an evaluation of opportunities for energy savings. Utility usage and cost data for electricity and propane gas for each of Gila County's facilities have been utilized in an effort to identify Energy Conservation Measure opportunities.

### BASE YEAR FOR UTILITY COSTS AND USAGE

The utility base year selected for this Audit was from April 2010 through March 2011. While the billing for utility services is not exactly contained within those dates, the adjustment process described herein converted the data to an accurate calendar month projection of usage and costs.

Weather for the base year can be described by the number of cooling degree days and heating degree days. 'Degree Days' is a simplified method of determining the impacts from weather to the facility's energy usage. For Gila County area, the number of annual degree days is summarized in the table below.

Table 3-0. Degree Days			
	Base Year (April 2010 - March 2011)	Degree Days 30 Year Average	Variance
<b>Cooling</b>	4,926	3,798	1,128
<b>Heating</b>	1,443	1,271	172

The table illustrates that the base year, April 2010 through March 2011, required more heating and cooling from an "average" year, calculated from a 30 year average. This variation will impact utility cost from year to year, as the cooling and heating degree days vary around the average. The actual number of cooling degree days will influence electricity and water consumption. The actual number of heating degree days will influence electricity and gas consumption.

### 3.1. RATE ANALYSIS

The first step of any billing analysis is an assessment of the billing rate and energy consumption requirements. This ensures that each site is being billed using the most appropriate tariff for their usage pattern. For Gila County a variety of tools were used to analyze and determine the most applicable rates to use for savings analysis. Specifically the following were used to determine rate schedules used herein:

- **Billing Data** – Billing data was collected for facilities where possible to analyze actual costs over a period of time for each facility. This data was rolled up to match the building inputs used for the Energy Conservation Measure Matrix (ECM Matrix). For this project some "estimated" data was necessary. For example, the new Public Works Facility only had one month of available billing data. Also the Guerrero complex was unoccupied during the audit period and data was estimated based on occupied periods from billing data.





- **Rate Schedules** – Actual rate schedules were obtained from the utility providers to each facility under consideration. Typically the rate schedule is utilized for analysis as it represents the most current rates whereas the billing data represents “average” rates over a period of time. Also using the actual rate schedules requires that only the components that are directly related to consumption are utilized for input to savings analysis.
- **Other Inputs** – Typically other inputs are necessary to determine appropriate savings input values. For any audit, the actual consumption of water, for example, is made up of sinks, lavatories, showers, and landscape irrigation. Breaking the consumption into determinants is done through an assessment of usage patterns, data available from a variety of sources (Department of Energy), and other inputs that provide a reasonable assessment of the overall consumption “end use” patterns.

The following list provides the overall utilities that provide service to the facilities considered herein:

- **Electric Service** – Electric services is provided to almost all facilities by Arizona Public Service (APS). The facilities are covered under three rate structures (E-32 XS, E-32-S, E-32M) depending on individual building components.
- **Natural Gas Service** – Where natural gas service is provided, it is provided by Southwest Gas.
- **Propane Gas Service** – The Payson Complex has propane service provided by SemStream Propane of Arizona.
- **Water Services** – The facilities are served by either Arizona Water Company or the City of Globe Water Division.
- **Sewer Services** – Wastewater services are provided by Gila County Wastewater.

The determination related to what rate schedules to use for each system analysis was based on the assessment of overall “average” rates, and comparison to actual rate structures. This is a critical assessment to ensure that using actual rates provides good comparison to overall energy consumption and cost patterns. For this audit, the following rate schedules were used for all savings analysis:

Table 3-1. Electric Meters										
Rate		Winter KW		Winter kWh	Blended	Blended		Gas Rate	Gas Rate	Water and
Schedule	Summer KW Rate	Rate	Sumer kWh Rate	Rate	KW Rate	kWh Rate	Notes	(\$/Therm)	(\$/gal)	Sewer Rate (\$/gal)
E32 XS	\$0.000	\$0.000	\$0.048600	\$0.040780		\$0.044690	0-20 KW			
E32 S	\$9.675	\$9.675	\$0.104030	\$0.086890	\$9.675	\$0.095460	20-100 KW			
E32 M	\$9.597	\$9.597	\$0.103200	\$0.086190	\$9.597	\$0.094695	100-400 KW			
G1							Natural Gas	\$1.2658		
P1							Propane	\$3.1850	\$3.5000	
WS1							Water/Sewer			

The schedules shown above are based on the actual rate schedules for each component of service. Where rates vary based on consumption or based on time of year, the rate was “blended” to provide one overall rate to be used for all analysis. This was necessary as the billing data had several meter inputs for each complex which required an overall averaging technique to limit analysis time on small services.



The following tables detail the buildings included in the analysis of savings opportunities.

Table 3-2. Electric Meters

Account #	Meter #	Serves	Address
747101288	765226	Courthouse	1400 E Ash St., Globe, AZ
571172284	D31050	Guerrero Complex	1400 E Ash St., Globe, AZ
906001284	847781	Globe Sheriff's office & Jail	South 7th St., Globe AZ
139840282	C45573	Michaelson Bldg (Downstairs)	157 S. Broad St., Globe AZ
176840287	F93465	Michaelson Bldg (Upstairs)	157 S. Broad St., Globe AZ
732014281	G71791	Central Heights Complex	5515 S Apache St., Globe AZ
376756285	P90906	Payson Admin Bldg.	610 E Hwy 260, Payson, AZ
253091284	764021	Payson Court Complex	714 S. Beeline Ste. 2, Payson, AZ
643532284	P19946	Payson Complex Suite 4	714 S. Beeline Ste. 2, Payson, AZ
722191287	738808	Payson Complex Superior Court	714 S. Beeline Ste. 2, Payson, AZ
837142285	E62479	Payson Complex Suite 5	714 S. Beeline Ste. 2, Payson, AZ
840112281	849464	Payson Complex	714 S. Beeline Ste. 2, Payson, AZ
844191284	764019	Payson Complex Suite 6	714 S. Beeline Ste. 2, Payson, AZ
927622285	929910	Payson Complex Suite 3	714 S. Beeline Ste. 2, Payson, AZ

Table 3-3. Gas Meters

Account #	Meter #	Serves	Address
461-0084147-021		Globe Sheriff's office & Jail	1100 E. South St., Globe AZ
461-0084147-021		Guerrero Complex	1400 E Ash St., Globe, AZ
461-0026693-022		Michaelson Bldg	157 S. Broad St., Globe AZ
461-0026693-022	609772	Payson Admin Bldg	610 E Hwy 260, Payson, AZ

Table 3-4. Water Meters

Account #	Meter #	Serves	Address
9.2118.01	41685816	Globe Courthouse	1400 E Ash St., Globe, AZ
7.2598.01	31944672	Globe Sheriff's office & Jail	1100 E. South St., Globe AZ
9.2116.01	46762417	Guerrero Complex	1400 E Ash St., Globe, AZ
5.0465.01	66874393	Michaelson Bldg	157 S. Broad St., Globe AZ
15.0940.01	1273489	Central Heights Complex	5515 S Apache St., Globe AZ
121270		Payson Complex	714 S. Beeline Ste. 2, Payson, AZ
00009057		Payson Admin Bldg	610 E Hwy 260, Payson, AZ



### 3.2. RATE FORECAST

In order to provide an assessment of future energy savings as part of the cash flow, future rates must be estimated. There are several ways to estimate future rate impacts by using a variety of tools available in the industry. In some cases historical rate escalation is used to predict future rate impacts. Some utilities provide detailed future planning data that can be summarized in the form of expected rate increases. Also the Department of Energy (DOE) provides tools for assessing future rate projections.

- **Historical Analysis** – This method was NOT chosen due to the current volatility of the energy market. Given the recent economic turmoil, and especially the volatility in the fuels markets, using historical data would not be appropriate for estimating future energy rates.
- **Utility Data** – Since there are several providers, and due to the amount of information available, it would be extremely difficult to use utility filings for estimates of future rate increases across all energy components in this audit.
- **DOE Energy Escalation Rate Calculator (EERC)** – It was determined that this would be the most effective tool for estimating rate impacts in future years for facilities included herein. The calculator uses a large database of inputs to “predict” future rate impacts. Required filings from utilities relevant to fuel and capacity additions, assessment of renewable energy markets, and regulatory requirements related to renewable energy and other production inputs are all considered in the assessment from the DOE rate escalation calculator. This tool provided by the Department of Energy provides a levelized rate escalation factor based on the following inputs:
  - Location – The rate escalation calculator allows the input of specific states. For this assessment Arizona was used as the appropriate input.
  - Fuel – The escalation calculator allows the use of specific fuel to determine specific fuel rate escalation. For this audit each fuel component (gas, electric) was input separately to determine the appropriate rate escalation for each component.
  - Inflation – The calculator adjusts the rate forecast for inflation. This allows the escalation factor to be adjusted for the value of the dollar in future years. For this audit and given the current estimates for inflation a 4% inflation rate was input.

### 3.3. UTILITY COSTS

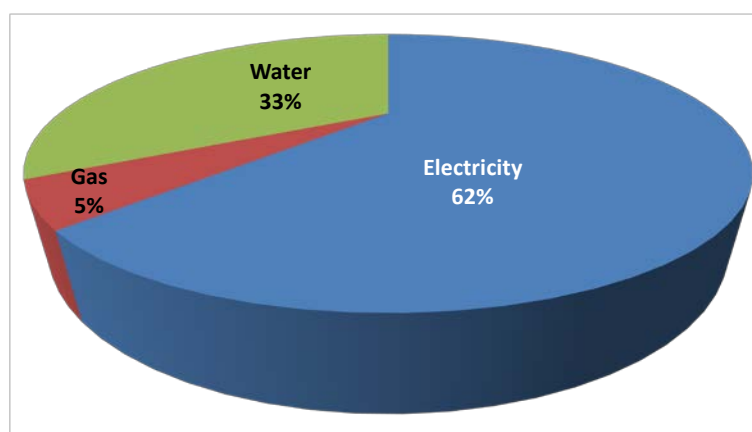
Based on available utility data the base year selected was from April 2010 through March 2011. The base year annual energy expenditures including electricity, gas and water for all facilities considered herein was approximately **\$777,353**.

It is important to note that these energy expenditures do not include the anticipated rate increases forecasted in future years. For the purpose of calculating energy savings, the selected Base year was used.



Table 3-5. Proposed Annual Energy and O&M Savings				
Utility	Existing Annual Cost	Proposed Annual Cost Avoidances	Reduction (%)	
Electricity	\$ 484,300	\$ 109,387	22.59%	
Gas	\$ 38,801	\$ 8,476	21.84%	
Water	\$ 254,252	\$ 32,797	12.90%	
Total Annual Cost Avoidance:	\$ 777,353	\$ 150,660	19.38%	

**FIGURE 3-0. ENERGY EXPENDITURES BY UTILITY (APRIL 2010 - MARCH 2011)**



### 3.4. ANNUAL SUMMARY BY USAGE AND COST

Table 3-6 provides a summary of the annual usage and cost for Gila County. Usage and cost data represents the annual totals for Base Year.

Table 3-6. Summary of Annual Usage						
Utility	Non-Coincident Peak Demand (kW)	Electricity Usage (kWh)	Propane Usage (MMBTU)	Water Usage (gallons)	Annual Cost (\$)	Cost/Unit
<b>Electricity</b>	1,052	3,684,691			\$ 484,300	\$0.131
<b>Gas</b>			28,908		\$ 38,801	\$1.342
<b>Water/Sewer</b>				4,902,463	\$ 254,252	\$0.052
<b>TOTAL:</b>					<b>\$777,353</b>	

The buildings being considered are essentially of two types. Office type buildings represent the majority of structures, with jail facilities the other major type of usage across the facilities considered.



### 3.5. MONTHLY ELECTRICITY COST, USAGE AND DEMAND ANALYSIS

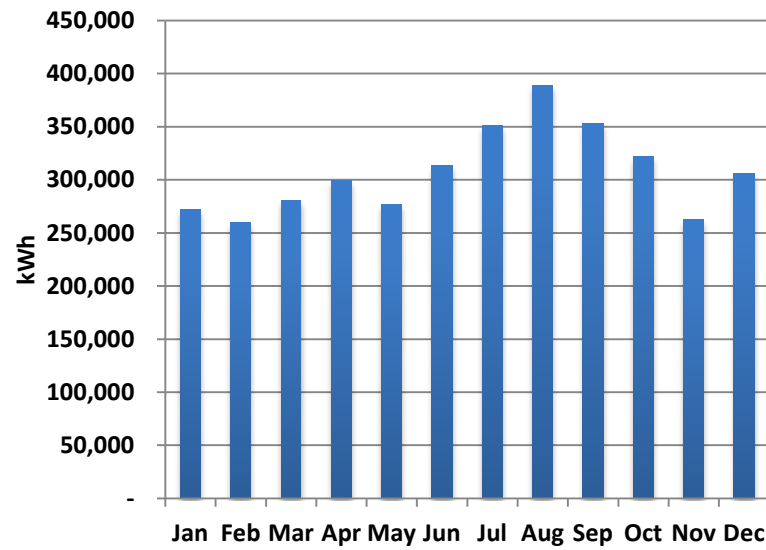
Analysis of the monthly billing usage and cost data provides an assessment of the load pattern for the facility. Monthly analysis is a method of identifying anomalies that are not accounted for based upon expected patterns. A typical usage and cost analysis will identify any particular months with unusual costs in order to focus on either the rate application or equipment consumption during the Audit.

Table 3-7 represents the actual electric data as it was billed for Gila County as a whole. Monthly variations are primarily due to cooling load requirements.

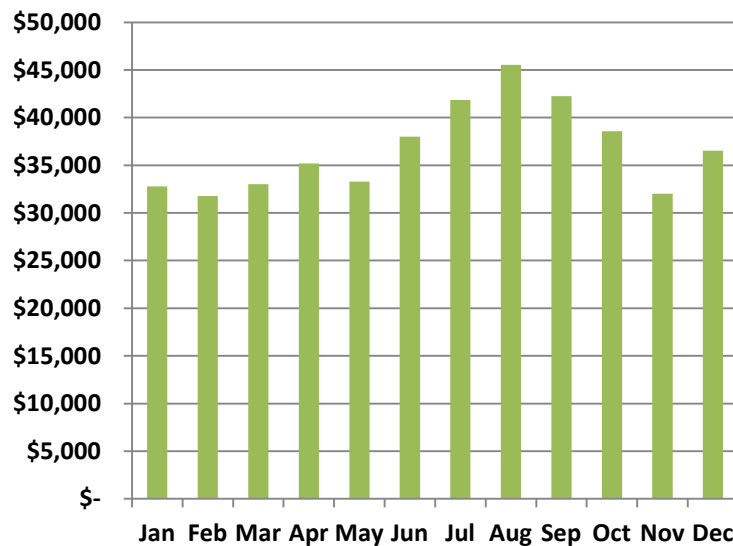
Table 3-7. Monthly Electric Usage and Costs Base Year		
Month	Usage (kWh)	Cost (\$)
Jan	271,813	\$ 32,764
Feb	259,604	\$ 31,791
Mar	280,268	\$ 33,018
Apr	299,653	\$ 35,199
May	277,012	\$ 33,299
Jun	313,503	\$ 37,989
Jul	350,703	\$ 41,862
Aug	388,604	\$ 45,523
Sep	353,450	\$ 42,242
Oct	321,658	\$ 38,559
Nov	262,570	\$ 31,995
Dec	305,854	\$ 36,535



**FIGURE 3-1. MONTHLY ELECTRICITY USAGE**



**FIGURE 3-2. MONTHLY ELECTRICITY COST**





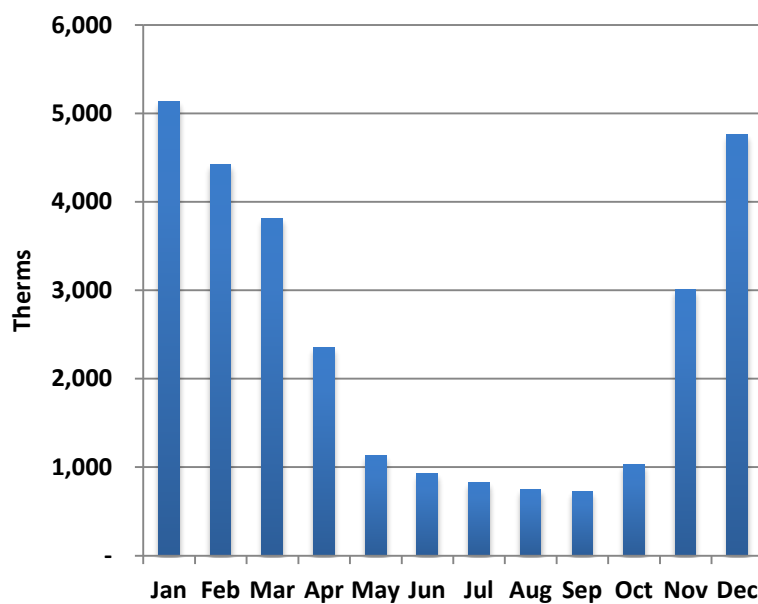
### 3.6. MONTHLY NATURAL GAS COST AND USAGE ANALYSIS

The following charts show a summarized history of monthly natural gas and propane gas bills for Gila County facilities for Base Year. For the propane account, the data was converted to Therms to include with the Natural Gas Analysis. The cost, however, is based on the actual cost per gallon of propane and cost per Therm of natural gas. This shows that the monthly usage is certainly higher in the heating months than cooling months.

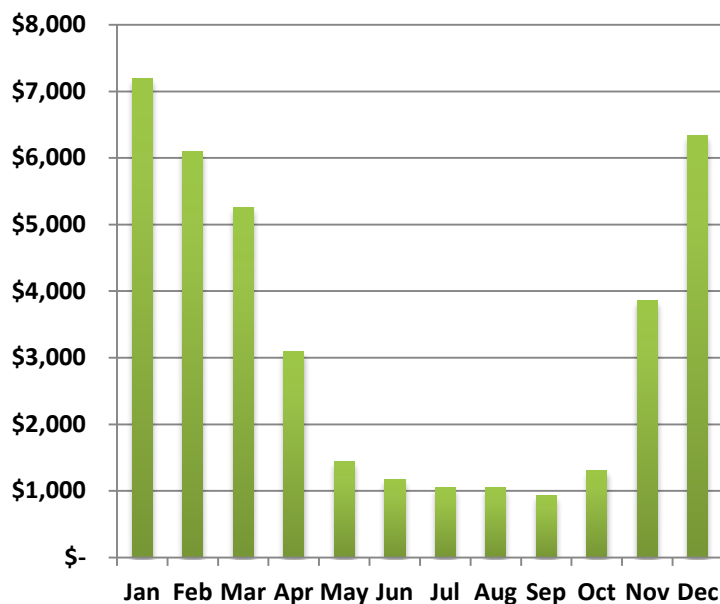
Table 3-8. Monthly Gas Purchases and Costs Base Year		
Month	Usage (therms)	Cost (\$)
<b>Jan</b>	5,129	\$ 7,194
<b>Feb</b>	4,426	\$ 6,095
<b>Mar</b>	3,816	\$ 5,264
<b>Apr</b>	2,357	\$ 3,097
<b>May</b>	1,132	\$ 1,445
<b>Jun</b>	930	\$ 1,177
<b>Jul</b>	830	\$ 1,050
<b>Aug</b>	748	\$ 1,054
<b>Sep</b>	731	\$ 925
<b>Oct</b>	1,031	\$ 1,305
<b>Nov</b>	3,012	\$ 3,861
<b>Dec</b>	4,766	\$ 6,334



**FIGURE 3-3. MONTHLY NATURAL GAS USAGE**



**FIGURE 3-4. MONTHLY NATURAL GAS COST**







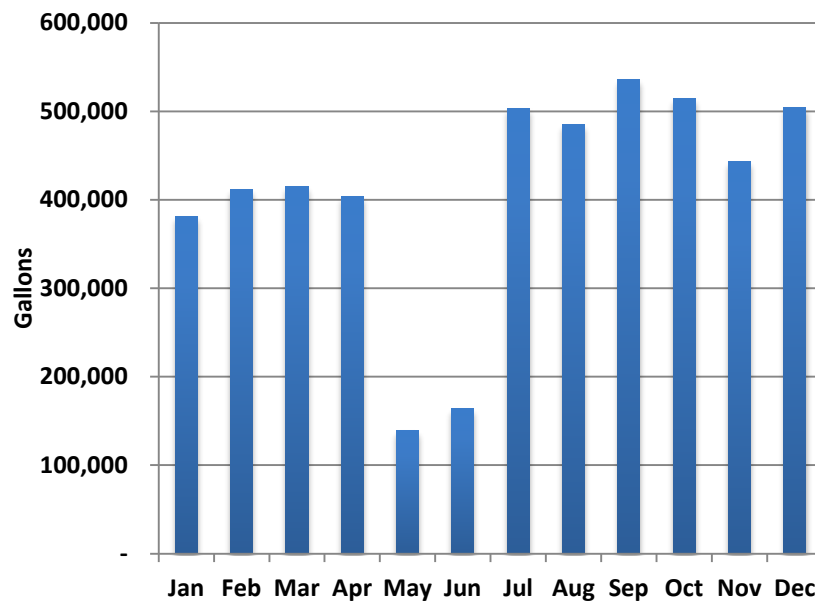
### 3.7. MONTHLY WATER COST AND USAGE ANALYSIS

The following charts show a summarized history of monthly water consumption and cost for Gila County facilities for Base Year.

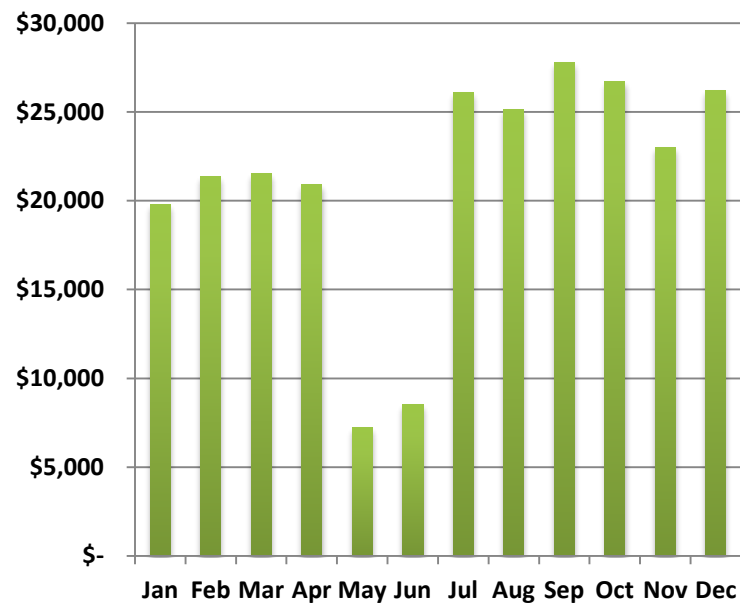
Table 3-9. Monthly Water Purchases and Costs Base Year		
Month	Usage (gallons)	Cost (\$)
<b>Jan</b>	381,365	\$ 19,778
<b>Feb</b>	412,278	\$ 21,382
<b>Mar</b>	415,187	\$ 21,532
<b>Apr</b>	403,412	\$ 20,922
<b>May</b>	139,183	\$ 7,218
<b>Jun</b>	163,886	\$ 8,499
<b>Jul</b>	503,022	\$ 26,088
<b>Aug</b>	485,323	\$ 25,170
<b>Sep</b>	535,942	\$ 27,795
<b>Oct</b>	514,539	\$ 26,685
<b>Nov</b>	443,415	\$ 22,996
<b>Dec</b>	504,912	\$ 26,186



**FIGURE 3-5. MONTHLY WATER USAGE**



**FIGURE 3-6. MONTHLY WATER COST**





### 3.8. BILLING ANALYSIS RECOMMENDATIONS

After reviewing the results of the billing data for each facility and developing baseline energy use, Ameresco Southwest conducted detailed analysis of the following Energy Conservation Measures (ECM). Each ECM has been evaluated for optimum savings benefits which meet the economic goals of Gila County.

- Interior and Exterior Lighting
- HVAC Systems
- HVAC Controls
- Water Retrofit
- Boiler Replacement
- Economizer Retrofit
- Programmable Thermostats

### 3.9. BUILDING AND METER DISAGGREGATION ISSUES

For this analysis, no meter aggregation was considered. In general each site has a separate meter for electric services. The only facility that could consider consolidation of electric metering would be the Payson Complex. However, after assessing the overall utility usage for these buildings, it was determined that the facility does not consume enough energy to make consolidation a viable option.

### 3.10. BASELINE ADJUSTMENTS

For the analysis contained herein, adjustments were made to utility billing analysis to utilize standard energy analysis tools. Billing data is not provided in a calendar month format, and all analysis tools use a calendar month for assessing savings opportunities. The adjustment method used followed the following:

- Billing data was entered based on actual meter read dates.
- The data was then assessed by calendar month using the most appropriate billing read dates for each calendar month (for example, a meter read of 11/22 thru 12/22 would correspond in general to December as a calendar month).
- The data was then converted to usage per day for the specific period.
- The daily usage was input to the number of days for that specific month to arrive at the calendar month usage figure.
- Each facility was then calibrated back to the actual usage annually using a simple percentage of number of days included in the assessment.
- Monthly costs were allocated based on the actual rate or using the same principle as used for consumption. Electric demand charges were based on the maximum demand for the billing period in any particular calendar month.



No other adjustments were made to utility data in order to arrive at the results of the analysis contained herein.

### 3.11. ENERGY INCENTIVE PROGRAMS

Anticipated rebates and performance based utility incentives that are currently available are discussed on the following pages. While Ameresco Southwest will administer the rebate application process, these values are not guaranteed, as rebates are on a first come first serve basis. APS offer energy incentive programs for reducing electrical consumption at a facility. The program provides incentives or rebates to promote the installation or upgrading of energy using equipment.

#### APS SOLUTIONS FOR BUSINESS

The program offers incentives (rebates) to small and large businesses to reduce energy consumption. Incentives are available for existing buildings and new construction. Large businesses customers can apply for rebates from a prescriptive menu of measures or they can propose custom projects. Large businesses can also qualify for assistance with energy studies and to participate in the Energy Information Services (EIS) program

##### Prescriptive: Order off the Menu

Small and large customers can choose from a prescriptive list of typical energy efficiency measures with fixed rebate levels. These apply to existing buildings (retrofit) and new construction projects.

- Lighting rebates range from \$1.75 to \$75 per unit.
- Refrigeration rebates range from \$5 to \$200 per unit
- Motors and VSD rebates range from \$1.50 to \$50 per horsepower.
- Cooling rebates include a base incentive plus efficiency incentive.

*The prescriptive program is likely the best option for Gila County given the types and magnitude of the recommended Energy Conservation Measures. The financial summary for this project used the estimated input from this program for rebate incentives.*

##### Custom: Create Your Own

Custom incentives are available to large business customers for energy-saving projects not included in the list of qualified prescriptive measures. The rebates apply to retrofit and new construction projects and are funded at \$0.11/ annual kWh savings.

##### Energy Studies: Take a Closer Look

Energy Study incentives provide partial reimbursement of feasibility studies, design assistance, commissioning and retro-commissioning services for new or existing facilities. Large business customers can apply for up to 50 percent of the qualifying study cost.



### Energy Information Services: Measure and Manage

A simple meter upgrade and our Energy Information Services (EIS) provide a quick-read summary of all the information you need to manage your energy budget. Large customers can apply for a one-time rebate of 75% of the cost of the installation of a new meter and setup fees, up to a maximum of \$900.

Examples of qualifying Energy Conservation Measures:

- Constant air volume to variable air volume conversion in existing construction
- Chiller replacement with a more efficient chiller
- Installation of variable frequency drives (VFDs) on existing chillers
- Installation of VFDs on air compressors
- Refrigeration compressor and condenser replacement with more efficient units
- Refrigerated case door efficiency retrofits
- Installation of direct or indirect evaporative cooling systems in place of vapor compression cooling



## 4.0 TECHNICAL REPORT

Ameresco Southwest is submitting the following Investment Grade Audit of Energy Conservation Measures to Gila County. The objective of this report is to identify Energy Conservation Measures (ECMs) that will improve operations and reduce operating and maintenance (O&M) costs through energy saving technologies and practices.

The Investment Grade Audit consists of energy studies of 31 Gila County buildings. The total interior square footage for these facilities is approximately 210,000.

The results of the Audit reveal total electric, gas and water savings opportunities of **\$150,660** per year. To achieve these savings, Ameresco Southwest has identified and recommended a number of ECMs. A detailed matrix of all recommended ECMs for each site can be found in *Table 4-1*. This matrix is a complete listing of all ECMs at each location.

The recommendations and findings of this effort are summarized in the following table:

Table 4-0. Proposed Annual Energy and O&M Savings				
Utility	Existing Annual Cost	Proposed Annual Cost Avoidances	Reduction (%)	
<b>Electricity</b>	\$ 484,300	\$ 109,387	22.59%	
<b>Gas</b>	\$ 38,801	\$ 8,476	21.84%	
<b>Water</b>	\$ 254,252	\$ 32,797	12.90%	
<b>Total Annual Cost Avoidance:</b>	<b>\$ 777,353</b>	<b>\$ 150,660</b>	<b>19.38%</b>	

Savings calculations for mechanical projects (HVAC and controls) Energy Conservation Measures are dependent on the schedule and temperature settings of the associated equipment. These settings are determined based on the site survey and interviews with facility personnel.

In evaluating the facilities included in this Audit, the team has identified and is in the process of evaluating a number of Energy Conservation Measures (ECMs) and the list of projects will be modified as the projects become more developed through detailed analysis. To achieve the savings, Ameresco Southwest has identified and recommended a number of ECMs. A detailed matrix of all recommended ECMs for each site is located in *Table 4-1*. This matrix is a complete listing of all ECMs at each location.



Table 4-1. ECM Matrix									
Location	Lighting/ Lighting Controls	Water Retrofit	Direct Digital Controls	HVAC Replacement	Economizer Retrofit	Boiler Replacement	DHW Replacement	VAV Retrofit	Programmable Thermostats
<b>GLOBE FACILITIES</b>									
Courthouse	X	X	X		X				
Sheriff & Jail	X	X	X	X	X	X	X		
Women's Dorm	X	X							
Juvenile Detention Center	X	X			X				
Guerrero Complex	X	X		X	X				
Central Heights Complex	X	X	X						
Fairgrounds (Exhibit Hall Only)	X	X							
New Operations Facility	X								
Michaelson Building	X	X		X	X				X
<b>PAYSON FACILITIES</b>									
Payson Complex	X	X	X						
Roosevelt Substation	X	X	X	X				X	
Sheriff's Office	X	X					X		
Public Works	X	X							
Transportation	X								

Table 4-2 Standards of Operations summarizes the “Existing” schedules and temperature set points identified during the site survey, while the “Proposed” conditions summarizes the schedules and temperature set points proposed by Ameresco Southwest. Both existing and proposed schedules and temperature set points have been incorporated in the calculations used to determine savings for the HVAC and Energy Management Controls System measures. The lighting savings and estimates for this project were estimated using a detailed room by room audit and an assessment of annual operating hours based on light loggers and other references for similar structures. Therefore, lighting does not typically operate by the same schedule as a building due to the fact some lights may be on or off during normal operating hours. The lighting operating hours and schedule/standard settings for HVAC systems must be approved by Gila County indicating confirmation of their validity for use in the savings calculations.



Table 4-2. Standards of Operation					
EXISTING			PROPOSED		
Location	Lighting Schedule	HVAC Schedule	Lighting Schedule	HVAC Schedule	Standardized Heat/Cool Setpoint
<b>Courthouse</b>	Refer to Table 4.2	24-7	Refer to Table 4.2	6a to 6p M-F Sat., Sun. and Holidays Off	Occupied 68/76 Unoccupied 58/86 W/3 Degree Adj.
<b>Sheriff's Office and Jail</b>	Refer to Table 4.2	24-7	Refer to Table 4.2	24-7	Occupied 68/76 W/3 Degree Adj.
<b>Juvenile Detention</b>	Refer to Table 4.2	24-7	Refer to Table 4.2	24-7	Occupied 68 Heating/76 Cooling
<b>Guerrero Complex</b>	Refer to Table 4.2	6:00a - 6:00 p M-F	Refer to Table 4.2	6:00 a - 6:00 p M-F	Occupied 68/76 Unoccupied 58/86 W/3
<b>Central Heights</b>	Refer to Table 4.2	6a to 5p M-F Including Holidays	Refer to Table 4.2	6a to 5p M-F Sat., Sun. and Holidays Off	Occupied 68/76 Unoccupied 58/86 W/3 Degree Adj.
<b>Fairgrounds Exhibit Hall</b>	Refer to Table 4.2	Off except during special events	Refer to Table 4.2	Off except during special events	Occupied 68/76
<b>Public Works Administration</b>	Refer to Table 4.2	6a to 5p M-F Including Holidays	Refer to Table 4.2	6a to 5p M-F	Occupied 68/76 Unoccupied 58/86
<b>Michaelson Building</b>	Refer to Table 4.2	24-7	Refer to Table 4.2	6a to 5p M-F	Occupied 68/76 Unoccupied 58/86
<b>Payson Complex</b>	Refer to Table 4.2	Varies by location	Refer to Table 4.2	6a to 6p M-F Sat., Sun. and Holidays Off	Occupied 68/76 Unoccupied 58/86 W/3 Degree Adj.
<b>Roosevelt Substation</b>	Refer to Table 4.2	24-7	Refer to Table 4.2	Occupied On Unoccupied Off	Occupied 68/76 Unoccupied 58/86 W/3
<b>Payson Sheriff's Office and Jail</b>	24/7	24/7	24/7	24/7	Occupied 68/76
<b>Payson Public Works</b>	Refer to Table 4.2	6a to 5p M-F	Refer to Table 4.2	6a to 5p M-F	Occupied 68/76 Unoccupied 58/86 W/3 Degree Adj.
<b>Transportation Office</b>	Refer to Table 4.2	24-7	Refer to Table 4.2	24-7	Occupied 68/76 Unoccupied 58/86





Table 4-3. Lighting Schedule

Usage Group	Area Description	Hours /Day	Days/ Week	Weeks/ Year	Existing Sensor Reduction	Burn Hours	Peak Usage Diversity Factor	Sensor Reduction Percentage
<b>EXT</b>	Exterior	12	7	52		4,368	0%	0%
<b>OO</b>	Open Office	12	5	52		3,120	90%	0%
<b>OO-S</b>	Open Office - New Sensor	12	5	52		3,120	90%	25%
<b>OO-ES</b>	Open Office - Existing Sensor	12	5	52	25%	2,340	90%	0%
<b>PO</b>	Private Office	10	5	52		2,600	90%	0%
<b>PO-S</b>	Private Office - New Sensor	10	5	52		2,600	90%	25%
<b>PO-ES</b>	Private Office - Existing Sensor	10	5	52	25%	1,950	90%	0%
<b>EXR</b>	Exam Room	6	5	52		1,560	90%	0%
<b>RR</b>	Rest Room	10	5	52		2,600	90%	0%
<b>RR-S</b>	Rest Room - New Sensor	10	5	52		2,600	90%	40%
<b>24</b>	24 Hour Operation	24	7	52		8,760	90%	0%
<b>24-S</b>	24 Hour Operation - New Sensor	24	7	52		8,760	90%	30%
<b>STG</b>	Storage	1	5	52		260	90%	0%
<b>CONF</b>	Conference Room	4	5	52		1,040	90%	0%
<b>CONF-S</b>	Conference Room - New Sensor	4	5	52		1,040	90%	0%
<b>CRT</b>	Court Rooms	10	5	52		2,500	90%	0%
<b>MECH</b>	Mechanical Room	2	4	52		416	90%	0%
<b>WHSE</b>	Warehouse and Shop	12	5	52		3,120	90%	0%
<b>WHSE-S</b>	Warehouse and Shop - New Sensor	12	5	52		3,120	90%	30%



## 4.1. LIGHTING/LIGHTING CONTROLS

The comprehensive lighting retrofit will affect over **3,180** fixtures at 31 sites included in this report. The goals of the project will improve light quality, maintain appropriate light levels by task, reduce energy consumption and standardize equipment in order to reduce continued operating and maintenance costs. Ameresco Southwest has evaluated the data and recommends improvement measures to include modifications to existing linear fluorescent lights, incandescent lamps, exit signs, High Intensity Discharge (HID) fixtures, exterior lighting and installation of occupancy and light level sensors.

All of the proposed upgrades will include high quality lamps and state-of-the art, proven, technologies. Lamps chosen will be high color rendering for all linear style lamps. Ballasts will include a combination of normal, low power and high power, as the task application dictates. The warranty from the manufacturer passes directly to Gila County, which will begin from the date of installation. In some instances, there will be lamp reductions within the existing luminaires and, where necessary, existing fixtures will be supplemented with a specifically designed reflector. Reflectors increase the efficiency and light output of the existing fixture.

Consideration was given to areas where occupancy sensors will be advantageous. This evaluation includes specific areas outlined in the detailed lighting summary in the appendices. Not all areas will be receiving sensors to control the hours of operation based on occupancy. The summary reflects criteria similar to areas that presently have sensors throughout Gila County facilities. Typically, switch sensors are suggested where a clear visual path, without obstructions, to where the sensor will be mounted is available, and will operate two or more lights in normally occupied space. After installation, all sensing time will be set to the maximum allotted time of 30 minutes and can be adjusted on an 'as needed' basis for up to 60 days after installation by the contractor.

Incandescent lighting will be upgraded with compact fluorescent replacements for both dimming and non-dimming applications. Material replacement will be provided for all of these retrofit components. Any and all of the existing lights currently operating with compact fluorescent lamps will not be considered as part of this project.

Lighting that currently has battery back-up to illuminate in case of emergency will have the same function after implementation of this project. This includes the exit signs slated for replacement with LED, that presently have battery back-up as noted in the appendices that follow this summary.

Work associated with this measure will be conducted at times that have minimal impact of normal, daily operation. Ameresco Southwest and its contractors will provide a schedule of construction and will cooperate with Gila County in gaining access and clearances to areas of special consideration. Sensitive equipment will be covered with appropriate material and areas left as clean as they were found. Cleaning of lenses will be dry dusting and dry wiping so as not to streak or dull them. Should the lenses need wet wipe, a quick evaporating solution and soft cloth will be used. The existing lenses that are broken or missing and will be replaced with a like material and lens pattern (not in price estimate at this juncture). Any lenses not noted and broken during installation will be replaced. Broken lamp holders contained in the lighting fixtures themselves will be replaced on an 'as needed' basis. Refuse from the work will be hauled to a dumpster provided by the contractor daily, which will be emptied as needed. Waste that is deemed potentially hazardous will be containerized,



transported, disposed of and recycled in accordance with County, State or Federal regulations and in accordance with strict safety standards set forth by Ameresco Southwest.

## 4.2. WATER RETROFIT

The proposed retrofit consists of a comprehensive replacement of high flow devices with low flow devices. Included at the facilities are replacement of valves and china where existing china would not support low flow valves. For this project, existing lavatories would be retrofit to fixtures using only 1.6 gallons per flush. Urinals would be replaced with units using only 1 gallon per flush. Aerators would be installed on lavatory sinks to reduce flow to 0.5 gallons per minute and at kitchen sinks to reduce flow to 1.5 gallons per minute. Janitorial sinks would not be retrofit as typically these require constant quantities of water not flow.

In addition it is proposed that a water control system be installed at the Globe Jail facility. Not only would this reduce the flow to devices in inmate areas, but it would also limit the number of flushes for lavatories. This technology has proven to be a substantial water saving option for many correctional facilities across the country and should prove very effective for Gila County.

## 4.3. DIRECT DIGITAL CONTROLS

The energy system controls for buildings for lighting, heating, ventilation and air conditioning were analyzed thoroughly to optimize comfort, ventilation standards and energy consumption.

The intent of this project is to upgrade, repair, re-commission, make fully operable, and furnish and/or install the following control systems or components at the following Gila County facilities:

- Gila County Courthouse
- Globe Sheriff's Office and Jail
- Central Heights
- Payson Complex
- Roosevelt Sheriff's Substation

The Payson Complex is already equipped with A Delta DDC system. This location would be re-commissioned and integrated with the other facilities on a common computer workstation.

The project scope is further defined as follows:

- Furnish and install a networked system of controls. New system would control all mechanical equipment in buildings indicated in matrix. The scheduling and setpoints would be accessible via the Gila County's internal network.
- Gila County would have a new computer with a graphical interface installed at the location of their choosing.



- Installation of new system is provided to maintain the standard of operations.

A networked energy management system tied to all conditioned areas will provide substantial temperature control improvements. Significant energy efficiency improvements would come from temperature adjustment limitation and time of day controls. The minimum key energy management and control strategies evaluated to generate energy savings include (as applicable):

- Zone temperature set point control
- Equipment and zone temperature scheduling including optimum start
- Setback control of unoccupied zones

The DDC System will improve HVAC reliability and enhance building efficiency while providing an easy to use interface for monitoring and managing the building. The system will provide the necessary hardware, software and network communication abilities to provide Scheduling, Monitoring, Trending and Alarm functions for the existing building HVAC systems.

The BMS would consist of a high-speed, peer-to-peer network of DDC controllers and a web-based operator interface (at a central location). The intent is to locate the building main controller board in an existing IT room. The application specific controllers will then be networked together with the ability to use a laptop computer for a direct connect application on site or use the internet to access the system remotely. The system would depict each mechanical system and building floor plan by a point-and-click graphic. A web server with a network interface card would gather data from the BMS and generate web pages accessible through a conventional web browser on each PC connected to the network. Operators would be able to perform all normal operator functions through the web browser interface.

The BMS would directly control HVAC equipment as specified in the sequences of operations (to be determined). Each zone controller would provide occupied and unoccupied modes of operation by individual zone. The system would provide energy conservation features such as optimal start and stop, night setback and demand level adjustment of setpoints as specified. The BMS would provide for future system expansion.

The system would use the BACnet protocol for communication to the operator workstation or web server and for communication between control modules. Schedules, setpoints, trends, and alarms specified in sequences of operation would be BACnet objects.

#### **4.4. HVAC REPLACEMENT**

Many buildings have older rooftop units and split systems or central plant equipment that can be replaced with more energy efficient and environmentally friendly equipment. These projects will replace the equipment and compliment the controls retrofits projects to ensure that they are only running when they need to and operating the most efficiently that they can during their normal operation.



The intent of this project is to replace specific HVAC equipment with new high efficiency equipment at each of the following locations:

- Globe Sheriff's Office and Jail
- Guerrero Complex
- Michaelson Building

#### GLOBE SHERIFF'S OFFICE AND JAIL

The scope of work for this facility includes replacement of older packaged rooftop heat pumps and replacement and/or refurbishment of supply air fans S-3 through 7. The scope includes replacement of heating coils, evaporative coolers, and repair and refurbishment of all dampers, filter racks, etc.

Remove each of the following units:

MANUFACTURER	MODEL NO.	SERIAL NO.	TONS	VOLTS/PH/HZ
TRANE	WCC060F400BE	N132S5M2H	5.0	460/3/60
TRANE	WCC036F100BB	L415YKR1H	3.0	208/230/1/60

Replace these units with new high efficiency packaged units the meet or exceed ASHRAE 90.1 and/or Energy Star compliance. The new units would be equipped with economizers and use R410A.

Replacement and refurbish SAF 3 – 7 includes removal and replacement of each supply fan, motor, belts, heating coil and evaporative cooler. It also includes cleaning, repair or refurbishment of each air handler to ensure proper operation of all dampers evaporative coolers, heating coils, etc. The controls contractor would furnish new control valves to be installed by the mechanical contractor. The controls contractor would demolish and remove the existing pneumatic and electric controls and replace with new DDC under separate scope. The existing units do not have nameplates. The as-built drawings list the following data:

MARK	MANUFACTURER	MODEL NO.	SERIAL NO.	CFM	TSP
SAF-3	BARRY	7182	-	5000	0.75
SAF-4	BARRY	H7182	-	5000	1
SAF-5	BARRY	7182	-	5000	0.75
SAF-6	BARRY	H7182	-	5000	1
SAF-7	McQUAY	LHD	-	3800	1

Replace the existing fans using Dayton 3C048A or equal. Note: two of the fans for S-2 and S-3 are located at the site but not yet installed. The contractor would include installation labor but not material for these units. All motors would be premium efficiency. The new heating coils would be sized to work with new condensing boilers covered under the ECM 6 scope of work.



The evaporative coolers are identified from the as-built drawings as follows:

MARK	LOCATION	MANUFACTURER	MODEL NO.	SERIAL NO.	CFM
2	SF-3,4	AIRDYNE	AC-100	-	10000
3	SF-5,6	AIRDYNE	AC-100	-	10000
4	-	AIRDYNE	AC-40	-	4000

Heating coils are identified from the as-built drawings as follows:

MARK	SQ. FT.	CFM	EAT	LAT	EWT	GPM
1	8	5000	25	90	200	18
1	8	5000	25	90	200	18
1	8	5000	25	90	200	18

### GUERRERO COMPLEX

Remove each of the following units:

MANUFACTURER	MODEL NO.	SERIAL NO.	(TONS)	INPUT MBH	OUTPUT MBH	VOLTS/HZ/PH
GOODMAN	PGB048125-1	9804618059	4	115	NA	208-230/60/1
GOODMAN	PGB048125-1	9711814220	4	115	NA	208-230/60/1
GOODMAN	PGB048125-1	9711814216	4	115	NA	208-230/60/1
GOODMAN	PGB048125-1	9705815008	4	115	NA	208-230/60/1

Replace these units with new high efficiency packaged units the meet or exceed ASHRAE 90.1 and/or Energy Star compliance. The new units would be equipped with economizers and use R410A.

### MICHAELSON BUILDING

Remove the following split heat pump including the indoor and outdoor units.

LOCATION	MANUFACTURER	OUTDOOR					
		MODEL NO.	SERIAL NO.	COOLING TONS	ELECT	COMP 1 PH	RLA
ROOF	CARRIER	50DQ006610	50DQ501174B	5	NA	NA	NA

Replace these units with new high efficiency packaged units the meet or exceed ASHRAE 90.1 and/or Energy Star compliance. The new units would use R410A.



## 4.5. ECONOMIZER RETROFIT

The intent of this project is to repair or install new economizers at each of the following locations:

- Gila County Courthouse
- Juvenile Detention
- Globe Sheriff's Office and Jail
- Guerrero Complex
- Michelson Building

### GILA COUNTY COURTHOUSE

Furnish and install new dry bulb economizers for each of the following packaged units. Economizers would include controllers and control interface to existing units for a complete installation.

MANUFACTURER	MODEL NO.	SERIAL NO.	TONS	VOLTS/HZ/PH
TRANE	WSC090A3R0A1H001	447100849L	7.5	208-230/60/3
TRANE	WCC018F100BD	N301PC12H	1.5	208-230/60/1
TRANE	WSC048A3R0A1DA001	446101813L	4	208-230/60/3
TRANE	WSC090A3R0A1H001	447100845L	7.5	208-230/60/3
TRANE	WSC060A3R0A1BA001	447100580L	5	208-230/60/3
TRANE	WSC090A3R0A1H001	447100781L	7.5	208-230/60/3
TRANE	WSC090A3R0A1H001	447100713L	7.5	208-230/60/3
TRANE	WSC090A3R0A1H001	447100711L	7.5	208-230/60/3
TRANE	WCC018F100BD	N165PUU2H	1.5	208-230/60/1
TRANE	WSC090A3R0A1H001	447100847L	7.5	208-230/60/3
TRANE	WSC048A3R0A1DA001	446102398L	4	208-230/60/3
TRANE	WSC036A1R0A1CA001	446101889L	3	208-230/60/1
TRANE	WSC090A3R0A1H001	447100709L	7.5	208-230/60/3
TRANE	WSC036A1R0A1CA001	446102522L	3	208-230/60/1
TRANE	WSC090A3R0A1H001	447100777L	7.5	208-230/60/3
TRANE	WSC090A3R0A1H001	447100645L	7.5	208-230/60/3
TRANE	WSC090A3R0A1H001	447100779L	7.5	208-230/60/3

### JUVENILE DETENTION

This building is equipped with packaged units and economizers. The economizer located on AC-7 is broken and would be repaired.



#### GLOBE SHERIFF'S OFFICE AND JAIL

Furnish and install new dry bulb economizers for each of the following packaged units. Economizers would include controllers and control interface to existing units for a complete installation.

MANUFACTURER	MODEL NO.	SERIAL NO.	TONS	VOLTS/PH/HZ
TRANE	WCP060F400AD	5023LK02H	5.0	460/3/60
TRANE	WCP060F400AD	50224WW2H	5.0	460/3/60
TRANE	WCP060F400AD	503146L2H	5.0	460/3/60
TRANE	WCP060F400AD	5033JUK2H	5.0	460/3/60

#### GUERRERO COMPLEX

Furnish and install new dry bulb economizers for each of the following packaged units. Economizers would include controllers and control interface to existing units for a complete installation.

MANUFACTURER	MODEL NO.	SERIAL NO.	(TONS)	INPUT	OUTPUT	VOLTS/HZ/PH
TRANE	4YCC3048A1096AB	9101KL89H	4	96	77.5	208-230/60/1
TRANE	2YCX3048A1075AA	7063NG89H	4	75	60.5	208-230/60/1

#### MICHELSON BUILDING

Furnish and install new dry bulb economizers for each of the following packaged units. Economizers would include controllers and control interface to existing units for a complete installation.

MANUFACTURER	MODEL NO.	SERIAL NO.	(TONS)	INPUT	OUTPUT	VOLTS/HZ/PH
TRANE	4YCC3048A1120AA	8371RWY9H	4	120	96.5	208-230/60/1
TRANE	4YCC3048A1120AA	8403KH59H	4	120	96.5	208-230/60/1
TRANE	4YCC3048A1120AA	8405X5M9H	4	120	96.5	208-230/60/1

## 4.6. BOILER REPLACEMENT

#### GLOBE SHERIFF'S OFFICE AND JAIL

This measure would remove the existing boiler (listed below), expansion tank, heating pumps, flue, piping and electrical as needed to replace the existing 1,650 MBH boiler with two new equally sized high efficiency condensing boilers. The new boilers would have a combined output of not less than 1,320 MBH at site elevation. The project scope includes a complete replacement of the boilers and auxiliaries including new pumps, expansion tank, pot feeder, combustion air, flue piping, condensate neutralizer, controls, electrical equipment, and any other equipment as needed for a complete installation. The new boilers would have an efficiency of not less than 95%.

LOCATION	MANUFACTURER	MODEL NO.	SERIAL NO.	TYPE	INPUT (MBH)	OUTPUT (MBH)
MECH RM	RITE	165WC	8017912	NAT DRAFT	1650	1320





## 4.7. DHW REPLACEMENT

### GLOBE SHERIFF'S OFFICE AND JAIL

This project would remove the existing water heaters (listed below), expansion tank, heating pumps, flue, piping and electrical as needed to replace the existing 399.9 MBH units with two new equally sized high efficiency condensing water heaters. The new water heaters would have an output of not less than the existing units at site elevation. Furnish and install new pumps, expansion tank, combustion air, flue piping, condensate neutralizer, controls, mixing valve, electrical equipment, and any other equipment as needed for a complete installation. The new water heaters would have an efficiency of not less than 95%.

MANUFACTURER	MODEL NO.	SERIAL NO.	MBH	GAL	RECOVERY
RHEEM	G100-400A	URNG1000G02805	399,900	100	1376 GPH
RHEEM	G100-400A	URNG1000G02802	399,900	100	1376 GPH

## 4.8. VAV RETROFIT

### ROOSEVELT SUBSTATION

This facility is equipped with a Carrier VVT bypass VAV system of a nominal 15 tons with electric reheat. The scope of this project would remove the existing indoor and outdoor units and replace them with a new high efficiency condensing unit with variable capacity scroll compressors for use with an indoor unit with VFD fan control. The following table describes the existing outdoor unit.

MANUFACTURER	MODEL NO.	SERIAL NO.	COOLING	ELECT
			MBTUH	
CARRIER	38AKS016---521--	3404F53046	176	208/230/3

Furnish and install a new condensing unit with variable capacity scroll compressors and matching indoor unit with VFD. Secure the bypass damper closed. The new unit would have R-410A, premium efficiency inverter rated fan motor and VFD. The new unit would not have an EER less than 11.

## 4.9. PROGRAMMABLE THERMOSTATS

This measure would furnish and install new programmable thermostats for each of the HVAC units located on the Michaelson Building.

## 4.10. OTHER PROJECTS CONSIDERED BUT NOT RECOMMENDED

An ICON® system was considered for the Payson Jail, but is not recommended due to the low water consumption from utility data related to that facility.



## 5.0 FACILITY AUDIT REPORTS

### 5.1. GILA COUNTY COURTHOUSE

1400 East Ash  
Globe, AZ 85235



Table A-0. Facility Facts	
COURTHOUSE	
Year Constructed	1976
Additions Constructed	N/A
Square Feet	47,076

The Gila County Courthouse was originally constructed in 1976 and the 47,076 square foot, three story structure serves the County Attorney, Superintendent of Schools, Finance Offices, Assessor's Office, Board of Supervisors, County Recorder's Office, Treasurer's Office, Superior Court, Justice Court, Magistrate Court, Court Clerk and many other county offices.

The following Standards of Operation table outlines the existing operating hours for the Courthouse. Where modifications to the current operating schedule are recommended to increase energy efficiency, they will be listed under the 'Proposed' heading.

Table A-1. Standards of Operation					
	Existing		Proposed		
	Lighting Schedule	HVAC Schedule	Lighting Schedule	HVAC Schedule	Standardized Heat/Cool Setpoint
Courthouse	Refer to Table 4.2	24-7	Refer to Table 4.2	6a to 6 p M-F Sat., Sun. and Holidays Off	Occupied 68/76 Unoccupied 58/86 W/3 Degree Adj.

#### 5.1.1. COURTHOUSE OVERVIEW

The following provides an overview of the existing systems at the courthouse, and include building envelope; lighting; domestic water and water heating; automation and controls; and HVAC air distribution systems.

#### BUILDING ENVELOPE

The building rests on concrete slab. The building envelope's exterior walls are primarily 8" concrete masonry units with brick veneer, furred interior walls and 1/2" gypsum board interior surface. The roof has



approximately 6 inches of rigid insulation over metal decking with a white membrane surface. Exterior doors are typically single pane tinted glass. Windows are typically metal frame, fixed single-pane with solar bronze tint. The windows located on the south side of the building were replaced with dual pane, low-e glazing with solar bronze tint. Weather stripping was installed in typical locations and appeared in “good” condition.

## LIGHTING

The lighting system at this facility is typically either T-12 fluorescent or a combination of T-12 and T-8 fluorescent lighting. The T-12 fixtures typically use either 40 watt or 34 watt energy savings lamps with magnetic ballasts. The T-8 lighting typically uses 32 watt lamps with standard electronic ballast. Gila County has been replacing the older T-12 technology with newer T-8 fixtures as fixtures fail, but there are still a significant number of T-12 fixtures remaining throughout the facility. Office spaces are equipped with some task lighting for additional light on work surfaces. There are still some incandescent fixtures in storage rooms or equipment rooms but most of the incandescent fixtures have been replaced with compact florescent lamps or fixtures. Exterior lighting is primarily high intensity discharge for area lighting and wall high intensity discharge wall pack fixtures for path and/or building illumination. The HID lighting is made up of Metal Halide and High Pressure Sodium lighting systems. Exit system lighting is a mixture of florescent and LED exit signs. Some old incandescent exit signs were also found during the energy audit.

## DOMESTIC WATER HEATING

The existing domestic hot water heating system consists of the units below in Table A-2. Domestic hot water is provided by small, point of use, under-counter electric units as shown in the following table. One additional water heater of approximately 6 gallons was found on the third floor. However, it was mounted in a manner that hid the nameplate.

Table A-2. Water Heating Inventory					
Equipment Name, Model #	Type	Location	Qty	Capacity	Heating Rating
Rheem, 81VP6S	Electric	Under-counter	1	6	2kW
Vanguard, 6E731	Electric	Under-counter	1	15	2kW
Reliance, 661OMSK	Electric	Closet	1	6	1.65kW

Water heating represents a small portion of the buildings electric load.

## BUILDING AUTOMATION AND CONTROLS

This building was originally controlled by a Honeywell Building Automation System that was removed from service. Currently, all of the heating and air-conditioning units are controlled by either manual or programmable thermostats. The few programmable thermostats were all operating in the “hold temperature” mode. This allows all of the HVAC systems to be enabled on a 24-7 basis. In cooling mode, the temperature setpoints ranged from 68F to 78F with an average temperature of 74F. Heating temperature setpoints were reported to be approximately 70F. The use of manual and programmable thermostats results in excessive runtime on the HVAC equipment and presents a good opportunity for energy savings with Direct Digital Controls (DDC).



## HVAC AIR DISTRIBUTION SYSTEMS

The courthouse is served by a combination of packaged and split system heat pumps. Packaged units served the 3<sup>rd</sup> floor and the top floors of the individual wings. Split heat pumps with indoor fan coils serve the majority of the 1<sup>st</sup> and 2<sup>nd</sup> floors of the building. Most of the heat pumps are approximately seven years old and are generally in good condition.

None of the packaged units are equipped with economizers. The relatively mild climate in Globe presents a good opportunity to save energy through the use of free cooling with economizers on these units.

Table A-3. Rooftop Unit Summary				
Unit	Mfr.	Model	Tons	Age
2	Trane	WSC090A3R0A1H001	7.5	Nov-04
3	Trane	WSC090A3R0A1H001	7.5	Nov-04
5	Trane	WSC090A3R0A1H001	7.5	Nov-04
6	Trane	WSC090A3R0A1H001	7.5	Nov-04
7	Trane	WSC090A3R0A1H001	7.5	Nov-04
8	Trane	WSC090A3R0A1H001	7.5	Nov-04
9	Trane	WSC090A3R0A1H001	7.5	Nov-04
12	Trane	WSC090A3R0A1H001	7.5	Nov-04
13	Trane	WSC090A3R0A1H001	7.5	Nov-04
21	Trane	WSC036A1R0A1CA001	3.0	Nov-04
23	Trane	WCC018F100BD	1.5	Jul-98
NA	Trane	WSC048A3R0A1DA001	4.0	Nov-04
NA	Trane	WSC060A3R0A1BA001	5.0	Nov-04
NA	Trane	WSC090A3R0A1H001	7.5	Nov-04
NA	Trane	WCC018F100BD	1.5	Apr-98
NA	Trane	WSC048A3R0A1DA001	4.0	Nov-04
NA	Trane	WSC036A1R0A1CA001	3.0	Nov-04

There are fourteen split systems located throughout the building. These systems are identified in Table A-4. All of the units appear to be in good operating condition.



Table A-4. Split System Summary				
Unit	Mfr.	Model	Tons	Age
NA	TRANE	TWA090A300FA	7.5	Oct-04
NA	TRANE	TWA090A300FA	7.5	Oct-04
NA	TRANE	TWA090A300FA	7.5	Oct-04
NA	TRANE	TWA090A300FA	7.5	Oct-04
HP22CH	TRANE	TWA090A300FA	7.5	Oct-04
HP16	TRANE	TWA090A300FA	7.5	Oct-04
HP11	TRANE	TWA090A300FA	7.5	Oct-04
HP17	TRANE	TWA090A300FA	7.5	Oct-04
HP15	TRANE	TWA090A300FA	7.5	Oct-04
NA	RUUD	UAMB-060JAX	5	Feb-03
NA	BRYANT	597CN024-A	2	NA
NA	MITSUBISHI	PUZ-A24NHA3	2	NA
NA	LG	LUU245HV	2	NA
NA	ICP	DFC2A318K1A	1.5	NA

The Grand Jury room is equipped with a stand-alone CO2 sensor interlocked to an outside air fan for ventilation of that zone.



## 5.2. SHERIFF'S OFFICE AND JAIL

100 South Street  
Globe, AZ 85235



Table B-0. Facility Facts

SHERIFF'S OFFICE & JAIL	
Year Constructed	1962
Additions Constructed	None
Square Feet	26,400

The Sheriff's Office and Jail is a single story building with a total of 26,400 square feet. The building was originally constructed in 1962. Office and administrative areas occupy 4,618 square feet and the remaining 21,782 square feet include the jail, laundry and culinary areas. Although there have not been any additions to the original structure, new buildings were constructed for Juvenile and Women's facilities that are now located offsite.

The following Standards of Operation table outlines the existing operating hours for the Sheriff's Office and Jail. Where modifications to the current operating schedule are recommended to increase energy efficiency, they will be listed under the 'Proposed' heading.

Table B-1. Standards of Operation

	Existing		Proposed		Standardized Heat/Cool Setpoint
	Lighting Schedule	AHU Schedule	Lighting Schedule	AHU Schedule	
Sheriff's Office and Jail	Refer to Table 4.2	24-7	Refer to Table 4.2	24-7	Occupied 68F Heating/76F Cooling

### 5.2.1. SHERIFF'S OFFICE AND JAIL OVERVIEW

The following provides an overview of the existing systems at the Sheriff's Office and Jail, and include building envelope; lighting; domestic water and water heating; automation and controls; and HVAC air distribution systems.



## BUILDING ENVELOPE

The building's floor is concrete slab on grade. The building envelope is comprised of 8" Concrete Masonry Units, heavy weight concrete tilt up or cast in place concrete walls. Exterior walls are not insulated. The roof is 6" concrete with light weight concrete fill and 2.5" foamed in place urethane roof insulation with a white surface finish. The building has very few windows except for the single pane store front entry and glass doors. Weatherstripping is considered fair, however with few exterior doors infiltration is not a concern.

## LIGHTING

The lighting system at this facility is typically either T-12 fluorescent or a combination of T-12 and T-8 fluorescent lighting. The T-12 fixtures typically use either 40 watt or 34 watt energy savings lamps with magnetic ballasts. The T-8 lighting typically uses 32 watt lamps with standard electronic ballast. Gila County has been replacing the older T-12 technology with newer T-8 fixtures as fixtures fail, but there are still a significant number of T-12 fixtures remaining throughout the facility. Office spaces are equipped with some task lighting for additional light on work surfaces. There are still some incandescent fixtures in storage rooms or equipment rooms but most of the incandescent fixtures have been replaced with compact florescent lamps or fixtures. Exterior lighting is primarily high intensity discharge for area lighting and wall high intensity discharge wall pack fixtures for path and/or building illumination. The HID lighting is made up of Metal Halide and High Pressure Sodium lighting systems. Exit system lighting is a mixture of florescent and LED exit signs. Some old incandescent exit signs were also found during the energy audit.

## DOMESTIC WATER HEATING

The existing domestic hot water heating system consists of the units below in Table B-2. Jails are typically large users of hot water for cooking, laundry and showers. The primary source of hot water are the two Rheem-Ruud natural gas water heaters located in the boiler room. Hot water recirculation is provided by a fractional horsepower Bell and Gossett pump. The kitchen is equipped with an electric booster heater as needed for dish washing.

Table B-2. Water Heating Inventory					
Equipment Name, Model #	Type	Location	Qty	Capacity	Heating Rating
Rheem-Ruud, G100-400A	Gas	Boiler Room	2	100 Gal	399,900 BTU
Reliance, 6522DRS	Electric	Kitchen	1	50 Gal	4,500 W

Although the Rheem-Ruud water heaters appear to be in good condition, they are natural draft units with a typical combustion efficiency of approximately 80%. These units are excellent candidates for replacement with new high-efficiency condensing water heaters with a combustion efficiency as high as 95%.

## BUILDING AUTOMATION AND CONTROLS

There are no building automation systems in this facility. All HVAC controls are stand-alone or manual thermostats. Given the HVAC systems and boiler plant identified in the following section, this building should be





retrofitted with a new DDC system. The proposed system would control all of the packaged equipment as well as the boiler plant, built up air handlers and exhaust fans.

## HVAC AIR DISTRIBUTION SYSTEM

HVAC systems vary throughout this facility. The office and administrative areas of the building are served by packaged rooftop heat pumps. Table B-3 provides a summary of the packaged rooftop heat pumps. Each of the packaged units are in good condition except as noted below.

Table B-3. Rooftop Unit Summary				
Unit	Mfr.	Model	Tons	Age
1	Trane	WCC060F400BE	5.0	1998
2	Trane	WCC036F100BB	3.0	1996
3	Trane	WCP060F400AD	5.0	2005
4	Trane	WCP060F400AD	5.0	2005
5	Trane	WCP060F400AD	5.0	2005
6	Trane	WCP060F400AD	5.0	2005

Packaged Rooftop Units 1 and 2 were manufactured in 1998 and 1996 respectively. These units are near their end of life and should be replaced with new high efficiency heat pumps. These units had efficiencies of approximately 10 SEER where as new units are available in 15 to 16 SEER. The proposed units would also be equipped with economizers for free cooling.

Packaged Rooftop Units 3 through 6 are in good condition but do not have economizers. These units should be retrofitted with new retrofit economizers to utilize free cooling.

Inmate areas utilize built-up air handlers with evaporative coolers and hot water coils. Each air handler is a constant volume single zone unit. The air handlers are interlocked with exhaust fans that also provide relief air when operating in economizer or evaporative cooling mode.

SAF-1 and 2 were recently rebuilt with new Dayton supply fans. However, all of the air handlers are in poor condition with inoperable damper actuators and control valves. The supply fans on SAF-3 through 6 are also in very poor condition and should be replaced.

Table B-4. Air Handler Summary				
Unit	Mfr.	Model	CFM	HP
SAF-1	DAYTON	3C048A	NA	1.5
SAF-2	DAYTON	3C048A	NA	1.5
SAF-3	BARRY	7182	5000	1.5
SAF-4	BARRY	H7182	5000	1.5
SAF-5	BARRY	7182	5000	1.5
SAF-6	BARRY	H7182	5000	1.5
SAF-7	McQUAY	LHD	3800	2/0.9





Ameresco Southwest recommends refurbishing SAF-1 through 4. The project would utilize the new Dayton fans already installed on SAF-1 and 2 as well as the new Dayton fans for SAF-2 and 3 that were purchased by Gila County but not yet installed. The proposed project would replace the heating coils, evaporative coolers, refurbish the existing dampers and retrofit each unit with new DDC controls and new premium efficiency motors. The new heating coils would be sized for use with the new proposed condensing boiler identified below. SAF-7 would be removed and replaced with a new roof mounted make-up air unit with hot water coil and evaporative cooler. The new unit would be ducted into the existing SAF-7 supply and return ducts located in the SAF-7 mechanical room.

## BOILER SYSTEM

SAF-1 through 7 are served by the boiler identified in Table B-5. The existing natural draft boiler has a nameplate efficiency of 80%. However, it's seasonal efficiency is much lower resulting in high natural gas costs when compared to new high efficiency condensing boilers.

Ameresco Southwest recommends a comprehensive boiler plant replacement for this facility. The proposed project would remove the existing boiler pump, expansion tank, flue and boilers auxiliaries. The proposed measure would replace them with two new equally sized high efficiency condensing boilers and new pumps, expansion tanks, neutralizers, combustion air ducting and exhaust flues. The project would also utilize new DDC supervisory controls.

Table B-5. Boiler Summary				
Unit	Mfr.	Model	Input	Output
B-1	Rite	165WC	1,650 MBH	1,320 MBH

Boiler B-1 is served by a single hot water pump that distributes heating water to SAF-1 through 7. Table B-6 provides a summary description of the pump. This pump and motor would be replaced as part of the above mentioned boiler plant replacement. The new pump would also be provided with a new premium efficiency motor.

Table B-6. Pump Summary				
Unit	Mfr.	Model	GPM	HEAD
P-1	THRUSH	TV2G	75	58 Ft



### 5.3. JUVENILE DETENTION

1425 South Street.  
Globe, AZ 85235



Table C-0. Facility Facts

JUVENILE DETENTION	
Year Constructed	2000
Additions Constructed	N/A
Square Feet	12,392

The Juvenile Detention facility is a single story building that totals 12,392 square feet. The building was originally constructed in 2000 and is one of the newer county buildings. The facility includes offices, conference room, classrooms, dormitory and small kitchen and laundry areas.

The following Standards of Operation table outlines the existing operating hours for the Juvenile Detention facility. Where modifications to the current operating schedule are recommended to increase energy efficiency, they will be listed under the 'Proposed' heading.

Table C-1. Standards of Operation

	Existing		Proposed		
	Lighting Schedule	AHU Schedule	Lighting Schedule	AHU Schedule	Standardized Heat/Cool Setpoint
Juvenile Detention	Refer to Table 4.2	24-7	Refer to Table 4.2	24-7	Occupied 68F/76F

#### 5.3.1. JUVENILE DETENTION OVERVIEW

The following provides an overview of the existing systems at the Juvenile Detention facility, and include building envelope; lighting; domestic water and water heating; automation and controls; and HVAC air distribution systems.

#### BUILDING ENVELOPE

The building rests on concrete slab. The building envelope is comprised of 8" split faced CMU and CMU with stucco exterior surface. The office area interior walls are furred and insulated and common areas have exposed CMU with a painted surface finish. The roof is built up composition with a grey finish over decking and rigid



insulation. Exterior doors are typically aluminum or hollow metal steel. Windows are typically metal frame, dual-pane units that are tinted and can open. Weather stripping was installed in typical locations and appeared in “good” condition.

## LIGHTING

The lighting system at this facility is typically either T-12 fluorescent or a combination of T-12 and T-8 fluorescent lighting. The T-12 fixtures typically use either 40 watt or 34 watt energy savings lamps with magnetic ballasts. The T-8 lighting typically uses 32 watt lamps with standard electronic ballast. Gila County has been replacing the older T-12 technology with newer T-8 fixtures as fixtures fail, but there are still a significant number of T-12 fixtures remaining throughout the facility. Office spaces are equipped with some task lighting for additional light on work surfaces. There are still some incandescent fixtures in storage rooms or equipment rooms but most of the incandescent fixtures have been replaced with compact florescent lamps or fixtures. Exterior lighting is primarily high intensity discharge for area lighting and wall high intensity discharge wall pack fixtures for path and/or building illumination. The HID lighting is made up of Metal Halide and High Pressure Sodium lighting systems. Exit system lighting is a mixture of florescent and LED exit signs. Some old incandescent exit signs were also found during the energy audit.

## DOMESTIC WATER HEATING

The existing domestic hot water heating system consists of the units below in Table C-2. Each of the two forced draft natural gas water heaters appeared to be in good condition.

Table C-2. Water Heating Inventory					
Equipment Name, Model #	Type	Location	Qty	Capacity	Heating Rating
AO Smith, BTP140-720	Gas	cal Room	2	140 Gal	720 MBH

## BUILDING AUTOMATION AND CONTROLS

This building utilizes manual thermostats to control the roof top packaged units and split systems. Given the unitary equipment and the 24 hour operation of this building, manual thermostats are considered appropriate for the application. Many of the thermostats were located behind tamper proof lock boxes.

## HVAC AIR DISTRIBUTION SYSTEM

The existing rooftop units are the original equipment installed with the construction of the building.

The heating/cooling distribution system is provided by eight roof top gas-electric package units and four split system heat pumps. Each of the packaged units is equipped with economizers.

The units were generally found to be in good condition except that the 7.5 ton packaged unit AC-7, has an economizer that is not working correctly. The outside air damper on this unit was found to be 100 percent open when the unit was in compressor cooling mode. This results in high energy costs associated with the conditioning of excessive outside air.



Ameresco Southwest recommends repairing of the AC-7 economizer and restoring the minimum outside air volume. Table C-3 provides a summary of the packaged units

Table C-3. Rooftop Unit Summary				
Unit	Mfr.	Model	Tons	Age
AC-1	Carrier	48HJE006---531HE	5	2000
AC-2	Carrier	48HJE006---531HE	5	2000
AC-3	Carrier	48HJE006---531HE	5	2000
AC-4	Carrier	48HJE006---531HE	5	2000
AC-5	Carrier	48HJE007---531HE	6	2000
AC-6	Carrier	48HJE007---531HE	6	2000
AC-7	Carrier	48HJD008---531HE	7.5	2000
AC-8	Carrier	48HJD008---531HE	7.5	2000

The split systems are identified in Table C-4. All of the split systems appeared to be in good working order and there are no recommendations for this equipment.

Table C-4. Rooftop Unit Summary				
Unit	Mfr.	Model	Tons	Age
OU-1	Mitsubishi	PUH36EK	3	2000
OU-2	Mitsubishi	PUH18EK	1.5	2000
OU-3	Mitsubishi	PUH18EK	1.5	2000
OU-4	Carrier	38YCC030300	2.5	1998



## 5.4. GUERRERO COMPLEX

1400 East Ash Street  
Globe, AZ 85235



Table D-0. Facility Facts

GUERRERO COMPLEX	
Year Constructed	1998
Additions Constructed	N/A
Square Feet	5,976

The Guerrero Complex is a single story building that totals 5,976 square feet. The building was originally constructed in 1998. This building was previously used for Community Development and Public Works. These departments were recently moved to the new Public Works building. At the time of the audit this building was vacant. However, some remodeling work was in progress in preparation for the relocation of county finance offices.

The following Standards of Operation table outlines the existing operating hours for the Guerrero Complex. Where modifications to the current operating schedule are recommended to increase energy efficiency, they will be listed under the 'Proposed' heading.

Table D-1. Standards of Operation

	Existing		Proposed		
	Lighting Schedule	AHU Schedule	Lighting Schedule	AHU Schedule	Standardized Heat/Cool Setpoint
Guerrero Complex	Refer to Table 4.2	6:00 a - 6:00 p M-F	Refer to Table 4.2	6:00 a - 6:00 p M-F	Occupied 68/76 Unoccupied 58/86 W/3 Degree Adj.

Because the building is vacant, the existing and proposed AHU schedules are unknown at this time.

### 5.4.1. GUERRERO COMPLEX OVERVIEW

The following provides an overview of the existing systems at the Guerrero Complex, and include building envelope; lighting; domestic water and water heating; automation and controls; and HVAC air distribution systems.



## BUILDING ENVELOPE

The modular single story structure has an unconditioned crawlspace. The building envelope is comprised of 6" wood frame construction with R-19 fiberglass insulation. Exterior wall surfaces are stucco. The roof is single membrane over wood decking. The ceiling is insulated with R-19 fiberglass batts. Exterior doors are typically glass. Windows are typically metal frame, dual-pane units that are not tinted. Weather stripping was installed in typical locations and appeared in "good" condition.

## LIGHTING

At the time of the audit, this building was unoccupied. Light fixtures that were present were typically either T-12 fluorescent or a combination of T-12 and T-8 fluorescent lighting. The T-12 fixtures typically use either 40 watt or 34 watt energy savings lamps with magnetic ballasts. The T-8 lighting typically uses 32 watt lamps with standard electronic ballast. Gila County has been replacing the older T-12 technology with newer T-8 fixtures as fixtures fail, but there are still a significant number of T-12 fixtures remaining throughout the facility. Office spaces are equipped with some task lighting for additional light on work surfaces. There are still some incandescent fixtures in storage rooms or equipment rooms but most of the incandescent fixtures have been replaced with compact florescent lamps or fixtures. Exterior lighting is primarily high intensity discharge for area lighting and wall high intensity discharge wall pack fixtures for path and/or building illumination. The HID lighting is made up of Metal Halide and High Pressure Sodium lighting systems. Exit system lighting is a mixture of florescent and LED exit signs. Some old incandescent exit signs were also found during the energy audit.

## DOMESTIC WATER HEATING

The existing domestic hot water heating system consists of the units below in Table D-2.

Table D-2. Water Heating Inventory					
Equipment Name, Model #	Type	Location	Qty	Capacity	Heating Rating
Rheem, 81VP68	Electric	Under-counter	1	8 Gal	2000 W

## BUILDING AUTOMATION AND CONTROLS

This building is equipped with a Delta DDC system. The building is on the county's network and the DDC system communicates over the DSM router. The DDC system controls all six packaged units through the use of five zone sensors. (One sensor is used to control two packaged units serving a single zone). The DDC system is in good working condition and would be integrated into the proposed DDC expansion project.

## HVAC AIR DISTRIBUTION SYSTEM

There are six packaged units that serve this building. All of the packaged units are ground mounted gas electric units with side discharge. Four of the six units are candidates for replacement based on their age and inefficiency. None of the units are equipped with economizers. Table D-3 identifies these units.

Ameresco Southwest recommends replacement of the four older Goodman units that are near their end of normal service life. These units would be replaced with new, high efficiency units with economizers. The new



units would be ASHRAE 90.1 and/or Energy Star rated. The two newer Trane units would be retrofitted with economizers for free cooling.

Table D-3. Packaged Unit Summary				
Unit	Mfr.	Model	Tons	Age
1	Goodman	PGB048125-1	4	1998
2	Goodman	PGB048125-1	4	1997
3	Goodman	PGB048125-1	4	1997
4	Trane	4YCC3048A1096AB	4	Mar-09
5	Trane	2YCX3048A1075AA	4	Feb-07
6	Goodman	PGB048125-1	4	1997

The Guerrero Complex is also served by one split system. This unit is used to cool the server room and is not on DDC control. This unit appears to be in good condition and there are no changes needed at this time.

Table D-4. Split System Summary				
Unit	Mfr.	Model	Tons	Age
1	Mitsubishi	PUY-A24NHA	2	1998





## 5.5. CENTRAL HEIGHTS

5515 East Apache Street  
Globe, AZ 85235



Table E-0. Facility Facts	
CENTRAL HEIGHTS COMPLEX	
Year Constructed	N/A
Additions Constructed	2009
Square Feet	29,643

The Central Heights Complex is a multi-building complex that serves Health and Human Services, Community Services, COOP and Emergency Management services. The complex is owned by the school district and leased by the county. The main complex occupies 27,851 square feet. The Women-Infant-Children's (WIC) building was constructed in 2009 and occupies 1,792 square feet.

The following Standards of Operation table outlines the existing operating hours for the Central Heights Complex. Where modifications to the current operating schedule are recommended to increase energy efficiency, they will be listed under the 'Proposed' heading. Note that the building is equipped with programmable thermostats and that the schedules and setpoints varied widely.

Table E-1. Standards of Operation					
	Existing		Proposed		
	Lighting Schedule	AHU Schedule	Lighting Schedule	AHU Schedule	Standardized Heat/Cool Setpoint
Central Heights	Refer to Table 4.2	6a to 5p M-F Including Holidays	Refer to Table 4.2	6a to 5p M-F Sat., Sun. and Holidays OFF	Occupied 68/76 Unoccupied 58/86 W/3 Degree Adj.

### 5.5.1. CENTRAL HEIGHTS OVERVIEW

The following provides an overview of the existing systems at the Central Heights Complex, and include building envelope; lighting; domestic water and water heating; automation and controls; and HVAC air distribution systems.





## BUILDING ENVELOPE

The buildings in this complex have been extensively renovated. Floors are concrete slab. Building envelopes are comprised of split faced concrete block construction. The roof is a bronze standing seam metal roof. The interior of the wood framed roof surfaces are fitted with R-30 fiberglass batt insulation.

Exterior doors are typically glass. Windows are typically metal frame, dual-pane units. Weather stripping was installed in typical locations and appeared in “good” condition.

## LIGHTING

The lighting system at this facility is typically either T-12 fluorescent or a combination of T-12 and T-8 fluorescent lighting. The T-12 fixtures typically use either 40 watt or 34 watt energy savings lamps with magnetic ballasts. The T-8 lighting typically uses 32 watt lamps with standard electronic ballast. Gila County has been replacing the older T-12 technology with newer T-8 fixtures as fixtures fail, but there are still a significant number of T-12 fixtures remaining throughout the facility. Office spaces are equipped with some task lighting for additional light on work surfaces. There are still some incandescent fixtures in storage rooms or equipment rooms but most of the incandescent fixtures have been replaced with compact florescent lamps or fixtures. Exterior lighting is primarily high intensity discharge for area lighting and wall high intensity discharge wall pack fixtures for path and/or building illumination. The HID lighting is made up of Metal Halide and High Pressure Sodium lighting systems. Exit system lighting is a mixture of florescent and LED exit signs. Some old incandescent exit signs were also found during the energy audit.

## DOMESTIC WATER AND WATER HEATING

Domestic hot water is provided by one electric heater as shown in the following table.

Table E-2. Water Heating Inventory					
Equipment Name, Model #	Type	Location	Qty	Capacity	Heating Rating
AO Smith, ELSF 10 917	Electric	Restroom	1	10 Gal	1.5kW

## BUILDING AUTOMATION AND CONTROLS

This building utilizes programmable thermostats to control all of the split system heat pumps. The controls were found to be in “good” condition and the settings of the programmable thermostats were somewhat consistent with the building’s occupancy schedule. However, many thermostats were found to be incorrectly programmed.

This facility is an excellent candidate for a new DDC system. Although there are programmable thermostats in this building, many were found to be incorrectly programmed. These thermostats also fail to capture holiday savings opportunities. Ameresco Southwest recommends the installation of a new DDC system throughout the complex.

## HVAC AIR DISTRIBUTION SYSTEM

The heating/cooling distribution system is provided by split system heat pumps. All of the HVAC units appeared to be in good operating condition and are listed in Table E-3.



Table E-3. Split System Summary				
Unit	Mfr.	Model	Tons	Age
1	International Comfort Products	HCC048LAA	4	2003
2	International Comfort Products	HCC036LAA	3	2003
3	International Comfort Products	NHP224AKA1	2	2004
4	International Comfort Products	HCC048LAA	4	2004
5	International Comfort Products	HCC048LAA	4	2003
6	International Comfort Products	NHP024AKA1	2	2004
7	Mitsubishi	PUH42EK7	3.5	
8	International Comfort Products	HCC048LAA	4	2003
9	International Comfort Products	HCC036LAA	3	2003
10	International Comfort Products	HCC060LAA	5	2003
11	International Comfort Products	HCC048LAA	4	2004
12	Ruud	UPNL-049DAZ	4	2011
13	Ruud	UPNL-049DAZ	4	2010
14	Ruud	UPNL-049DAZ	4	2011
15	Ruud	UPNL-049DAZ	4	2011
16	International Comfort Products	HCC042LAA	3.5	2001
17	International Comfort Products	HCC048LAA	4	2004
18	International Comfort Products	HCC048LAA	4	2004
19	Mitsubishi	PUH18EK	1.5	
20	International Comfort Products	HCC036LAA	3	2004
21	International Comfort Products	HCC048LAA	4	2004
22	International Comfort Products	HCC060LAA	5	2003
23	Lennox	13HPX03623010	3	2009
24	Lennox	13HPX03623010	3	2009
24	Lennox	13HPX03623010	3	2009



## 5.6. FAIRGROUNDS EXHIBIT HALL

Highway 60 Milepost 255  
Globe, AZ 85235



Table F-0. Facility Facts

FAIRGROUNDS EXHIBIT HALL	
Year Constructed	1972
Additions Constructed	NA
Square Feet	15,125

The Fairgrounds Exhibit Hall was built in 1972 and occupies 15,125 square feet. This facility is typically used one weekend per month for a variety of events including horse racing and the county fair. It is also rented to private parties for weddings and receptions. The building has large multi-purpose areas together with a kitchen and restroom facilities.

The following Standards of Operation table outlines the existing operating hours for the buildings. Where modifications to the current operating schedule are recommended to increase energy efficiency, they will be listed under the 'Proposed' heading.

Table F-1. Standards of Operation

	Existing		Proposed		
	Lighting Schedule	AHU Schedule	Lighting Schedule	AHU Schedule	Standardized Heat/Cool Setpoint
Fairgrounds Exhibit Hall	Refer to Table 4.2	Off except during special events	Refer to Table 4.2	Off except during special events	Occupied 68/76 Unoccupied 58/86 W/3 Degree Adj.

### 5.6.1. FAIRGROUNDS EXHIBIT HALL OVERVIEW

The following provides an overview of the existing systems at the Fairgrounds Exhibit Hall, and include building envelope; lighting; domestic water and water heating; automation and controls; and HVAC air distribution systems.



## BUILDING ENVELOPE

This building is an engineered steel structure. The floor is slab on grade. Exterior walls are steel with furred R-19 interior walls. The roof is single membrane over 4" rigid insulation. There are no windows. Doors are hollow steel or roll-up in the high bay areas.

## LIGHTING

The lighting system at this facility is typically either T-12 fluorescent or a combination of T-12 and T-8 fluorescent lighting. The T-12 fixtures typically use either 40 watt or 34 watt energy savings lamps with magnetic ballasts. The T-8 lighting typically uses 32 watt lamps with standard electronic ballast. Gila County has been replacing the older T-12 technology with newer T-8 fixtures as fixtures fail, but there are still a significant number of T-12 fixtures remaining throughout the facility. Office spaces are equipped with some task lighting for additional light on work surfaces. There are still some incandescent fixtures in storage rooms or equipment rooms but most of the incandescent fixtures have been replaced with compact florescent lamps or fixtures. Exterior lighting is primarily high intensity discharge for area lighting and wall high intensity discharge wall pack fixtures for path and/or building illumination. The HID lighting is made up of Metal Halide and High Pressure Sodium lighting systems. Exit system lighting is a mixture of florescent and LED exit signs. Some old incandescent exit signs were also found during the energy audit.

## DOMESTIC WATER HEATING

The existing domestic hot water heating system consists of the units below in Table F-2. Domestic hot water is provided by one electric heater as shown in the following table.

Table F-2. Water Heating Inventory					
Equipment Name, Model #	Type	Location	Qty	Capacity	Heating Rating
American, EG2-1192-045DCV	Electric	Mechanical Room	1	119 Gal	4500W

## BUILDING AUTOMATION AND CONTROLS

This building utilizes programmable thermostats to control the heating equipment. The thermostats were found to be in the "Off" position when the building is unoccupied.

## HVAC AIR DISTRIBUTION SYSTEM

The heating/cooling distribution system is provided by two propane furnaces and two evaporative coolers. The units were generally found to be in "fair" condition and there are no HVAC measures recommended due to the facilities limited occupancy schedule.

Table F-3. Furnace Summary				
Unit	Mfr.	Model	Capacity	Age
Exhibit Hall	Ruud	UGPH-15EARJR	Heat only 150000 BTUH	1998

The building is also equipped with two identical MS625E Master Cool evaporative coolers with two speed 3 horsepower motors. There are no HVAC or control measures recommended for this facility.



## 5.7. PUBLIC WORKS ADMINISTRATION

745 North Rose Mofford Way  
Globe, AZ 85235



Table G-0. Facility Facts

PUBLIC WORKS ADMIN	
Year Constructed	2010
Additions Constructed	N/A
Square Feet	15,000

The Public Works Administration is a new building constructed in 2010. It occupies approximately 15,000 square feet. It serves the Public Works Administration, Engineering, Roads, Facilities, IT and Community Development departments.

The following Standards of Operation table outlines the existing operating hours for the Public Administration Building. Where modifications to the current operating schedule are recommended to increase energy efficiency, they will be listed under the 'Proposed' heading.

Table G-1. Standards of Operation

	Existing		Proposed		
	Lighting Schedule	AHU Schedule	Lighting Schedule	AHU Schedule	Standardized Heat/Cool Setpoint
Public Works Admin.	Refer to Table 4.2	6a to 5p Including Holidays	Refer to Table 4.2	6a to 5p M-F	Occupied 68/76 Unoccupied 58/86

### 5.7.1. PUBLIC WORKS ADMINISTRATION OVERVIEW

The following provides an overview of the existing systems at the Public Works Administration Building, and include building envelope; lighting; domestic water and water heating; automation and controls; and HVAC air distribution systems.



## BUILDING ENVELOPE

The buildings rest on concrete slab. The building is an engineered steel structure with furred interior walls with fiberglass batt insulation. The roof is a white standing seam metal roof with a foil backed R-30 fiberglass insulation on the interior surface. Windows are fixed, dual-tined in a metal frame and the exterior doors are metal with insulated core. Weatherstripping is considered good.

## LIGHTING

The lighting system at this facility is new and utilizes for interior lighting T-8 fluorescent lighting. The T-8 lighting typically uses 32 watt lamps with standard electronic ballast. Office spaces are equipped with some task lighting for additional light on work surfaces. Small areas are lighted with compact fluorescent lamps and/or fixtures. Exterior lighting is primarily high intensity discharge for area lighting and wall high intensity discharge wall pack fixtures for path and/or building illumination. The HID lighting is made up of Metal Halide and High Pressure Sodium lighting systems. Exit system lighting is LED technology at this facility.

## DOMESTIC WATER AND WATER HEATING

The existing domestic hot water heating system consists of the unit below in Table G-2. Domestic hot water is provided by one electric heater as shown in the following table.

Table G-2. Water Heating Inventory					
Equipment Name, Model #	Type	Location	Qty	Capacity	Heating Rating
Rheem, ES50-6-G-1	Electric	Mechanical Room	1	50 Gal	6kW

## BUILDING AUTOMATION AND CONTROLS

This building utilizes programmable thermostats to control the heating and cooling equipment. Two make up air units are on time clock control and start at 7:45 AM and turn off at 5:00 PM, seven days per week. The programmable thermostat setpoint and schedules varied widely and should be reprogrammed as needed for the buildings actual occupancy schedule.

## HVAC AIR DISTRIBUTION SYSTEMS

The heating/cooling distribution system is provided by split system heat pumps. The units are new and in good condition and there are no HVAC or control measures recommended for this facility. Table G-3 provides a summary of the HVAC equipment.



Table G-3. Split Heat Pump Summary				
Unit	Mfr.	Model	Capacity	Age
HP-1	Trane	4TWR3024A1000AA	2.0	2010
HP-2	Trane	4TWR3048A1000AA	4.0	2009
HP-3	Trane	4TWR3024A1000AA	2.0	2010
HP-4	Trane	4TWR3024A1000AA	2.0	2010
HP-5	Trane	4TWR3018A1000AA	1.5	2010
HP-6	Trane	4TWR3018A1000AA	1.5	2010
HP-7	Trane	4TWR3024A1000AA	2.0	2010
HP-8	Trane	4TWR3018A1000AA	1.5	2010
HP-9	Trane	4TWR3024A1000AA	2.0	2010
HP-10	Trane	4TWR3018A1000AA	1.5	2010
HP-11	Trane	4TWR3018A1000AA	1.5	2010
HP-12	Trane	4TWR3024A1000AA	2.0	2010
HP-13	Trane	4TWR3018A1000AA	1.5	2010
HP-14	Trane	4TWR3024A1000AA	2.0	2010
HP-15	Trane	4TWR3018A1000AA	1.5	2010
HP-16	Trane	4TWR3024A1000AA	2.0	2010
HP-OA/UI-1	Mitsubishi	PUY-A24NHA3	2.0	2010
HP-OA/UI-2	Mitsubishi	PUY-A36NHA3	3.0	2010
HP-OA/UI-3	Mitsubishi	PUY-A36NHA3	3.0	2009
HP-OA/UI-1	Mitsubishi	PUY-A24NHA3	2.0	2010





## 5.8. MICHAELSON BUILDING

157 South Broad Street  
Globe, AZ 85235



Table H-0. Facility Facts	
MICHAELSON BUILDING	
Year Constructed	1929
Additions Constructed	N/A
Square Feet	7,952

The Michaelson Building is a two story structure of 7,952 square feet. The first floor of the building serves the Child Support Division and the second floor of the building serves the county investigators and attorneys.

The following Standards of Operation table outlines the existing operating hours for the Michaelson Building. Where modifications to the current operating schedule are recommended to increase energy efficiency, they will be listed under the 'Proposed' heading.

Table H-1. Standards of Operation					
	Existing		Proposed		
	Lighting Schedule	AHU Schedule	Lighting Schedule	AHU Schedule	Standardized Heat/Cool Setpoint
Michaelson Building	Refer to Table 4.2	24-7	Refer to Table 4.2	6a to 5p M-F	Occupied 68/76 Unoccupied 58/86

### 5.8.1. MICHAELSON BUILDING OVERVIEW

The following provides an overview of the existing systems at the Michaelson Building, and include building envelope; lighting; domestic water and water heating; automation and controls; and HVAC air distribution systems.

#### BUILDING ENVELOPE

The building rests on concrete slab. The building envelope is a poured in place concrete structure. The wood frame roof has a composition shingle surface that has been painted white. The attic surface has approximately 6" of loose fill cellulose insulation. Exterior doors and windows on the first floor are single pane fixed. The





upstairs windows are single pane clear operable windows. Weather stripping was installed in typical locations and appeared in “fair” condition.

## LIGHTING

The lighting system at this facility is typically either T-12 fluorescent or a combination of T-12 and T-8 fluorescent lighting. The T-12 fixtures typically use either 40 watt or 34 watt energy savings lamps with magnetic ballasts. The T-8 lighting typically uses 32 watt lamps with standard electronic ballast. Gila County has been replacing the older T-12 technology with newer T-8 fixtures as fixtures fail, but there are still a significant number of T-12 fixtures remaining throughout the facility. Office spaces are equipped with some task lighting for additional light on work surfaces. There are still some incandescent fixtures in storage rooms or equipment rooms but most of the incandescent fixtures have been replaced with compact florescent lamps or fixtures. Exterior lighting is primarily high intensity discharge for area lighting and wall high intensity discharge wall pack fixtures for path and/or building illumination. The HID lighting is made up of Metal Halide and High Pressure Sodium lighting systems. Exit system lighting is a mixture of florescent and LED exit signs. Some old incandescent exit signs were also found during the energy audit.

## DOMESTIC WATER AND WATER HEATING

The existing domestic hot water heating system consists of the units below in Table H-2. Domestic hot water is provided by one electric heater as shown in the following table.

Table H-2. Water Heating Inventory					
Equipment Name, Model #	Type	Location	Qty	Capacity	Heating Rating
Rheem, 81VH40D	Electric	Closet	1	40 Gal	4.5kW
Ariston, GL4	Electric	Undercounter	1	4 Gal	1.5kW

## BUILDING AUTOMATION AND CONTROLS

This building utilizes manual and programmable thermostats. The programmable thermostats were found to be in the “hold temperature” position during the energy audit site visit. Ameresco Southwest recommends that all of the thermostats be replaced with new programmable thermostats and programmed for the actual occupancy schedule.

## HVAC AIR DISTRIBUTION SYSTEMS

The heating/cooling distribution system is provided by a combination of packaged gas electric units that serve the second floor and split heat pumps that serve the first floor. The packaged units are relatively new and in good condition except that they are not equipped with economizers. Ameresco Southwest recommends an economizer retrofit for each of the three packaged units.



Table H-3. Rooftop Unit Summary				
Unit	Mfr.	Model	Tons	Age
RTU 1	Trane	4YCC3048A1120AA	4.0	2008
RTU 2	Trane	4YCC3048A1120AA	4.0	2008
RTU 3	Trane	4YCC3048A1120AA	4.0	2008

There are two split system heat pumps. These units are identified in Table H-4. The 5-ton Carrier unit is very old, in poor condition and should be replaced with a new high efficiency unit. The new unit would be charged with R-410A that requires the indoor unit to also be replaced as part of this recommended measure.

Table H-4. Split System Summary				
Unit	Mfr.	Model	Tons	Age
HP-1	Inner City Products	CH5560VKC2	5.0	unknown
HP-2	Carrier	50DQ006610	5.0	unknown



## 5.9. PAYSON COMPLEX

714 South Beeline Highway  
Payson, AZ 85541



Table I-0. Facility Facts

PAYSON COMPLEX	
Year Constructed	1980
Additions Constructed	1990
Square Feet	16,071

The Gila County Complex in Payson Arizona consists of four buildings that provide a variety of services. Building A at 13,983 square feet is the Courthouse and includes administrative offices, County Attorney, CASA, Justice of the Peace, Superior Court, and the Probation Department. Building B with 7,796 square feet includes the Health Department, WICS and Flood Control offices. Building C houses the University of Arizona's Cooperative Extension office. Building D with 1,896 square feet includes the Assessor's and Recorder's offices.

The following Standards of Operation table outlines the existing operating hours for the Payson Complex. Where modifications to the current operating schedule are recommended to increase energy efficiency, they will be listed under the 'Proposed' heading.

Table I-1. Standards of Operation

	Existing		Proposed		
	Lighting Schedule	AHU Schedule	Lighting Schedule	AHU Schedule	Standardized Heat/Cool Setpoint
Payson Complex	Refer to Table 4.2	Varies by location	Refer to Table 4.2	6a to 6p M-F Sat., Sun. and Holidays Off	Occupied 68/76 Unoccupied 58/86 W/3 Degree Adj.

### 5.9.1. PAYSON COMPLEX OVERVIEW

The following provides an overview of the existing systems at the Payson Complex, and include building envelope; lighting; domestic water and water heating; automation and controls; and HVAC air distribution systems.



## BUILDING ENVELOPE

Building A is a two story wood framed structure. The floor is slab on grade. Exterior walls are insulated 6" nominal with sheetrock interior surface. The roof is composition shingle over wood trusses and sheathing. The attic is insulated with R-30 fiberglass. Windows are tinted dual pane and exterior doors are either single pane glass or insulated hollow core steel. Building B is a wood frame structure over crawl space. Exterior walls are 6" with wood exterior and sheetrock interior surface. The roof is composition shingle over wood trusses and sheathing. The attic has R-11 fiberglass insulation. Windows are single clear operable and doors are insulated hollow core steel. Building's C and D are of similar construction to B except that they have dual clear windows and 6" to 8" of loose fill insulation.

## LIGHTING

The lighting system at this facility is typically either T-12 fluorescent or a combination of T-12 and T-8 fluorescent lighting. The T-12 fixtures typically use either 40 watt or 34 watt energy savings lamps with magnetic ballasts. The T-8 lighting typically uses 32 watt lamps with standard electronic ballast. Gila County has been replacing the older T-12 technology with newer T-8 fixtures as fixtures fail, but there are still a significant number of T-12 fixtures remaining throughout the facility. Office spaces are equipped with some task lighting for additional light on work surfaces. There are still some incandescent fixtures in storage rooms or equipment rooms but most of the incandescent fixtures have been replaced with compact florescent lamps or fixtures. Exterior lighting is primarily high intensity discharge for area lighting and wall high intensity discharge wall pack fixtures for path and/or building illumination. The HID lighting is made up of Metal Halide and High Pressure Sodium lighting systems. Exit system lighting is a mixture of florescent and LED exit signs. Some old incandescent exit signs were also found during the energy audit.

## DOMESTIC WATER AND WATER HEATING

The existing domestic hot water heating system consists of the units below in Table I-2. Domestic hot water is provided by electric water heater as shown in the following table.

Table I-2. Water Heating Inventory					
Equipment Name, Model #	Type	Location	Qty	Capacity	Heating Rating
AO Smith, 9260378006	Electric	Bldg A	1	6 Gal	1.5kW
US Craftmaster, E1F30HD045V	Electric	Bldg A	1	30 Gal	NA
American, E51-40R-045D	Electric	Bldg B	1	40 Gal	4.5kW
GE, GE06P06SAG	Electric	Bldg C	1	6 Gal	2.0kW
AO Smith, ELJF 6 917	Electric	Bldg D	1	6 Gal	1.1kW

## BUILDING AUTOMATION AND CONTROLS

Building A is equipped with a Delta DDC system that is in good working order and is networked to the facilities department in Globe. Building's B, C and D utilize a combination of manual and programmable thermostats. All of the devices were found to be in good working condition.



## HVAC AIR DISTRIBUTION SYSTEMS

There is no natural gas at this site. Heating is provided primarily by heat pumps and/or electric coils located in the indoor fan coil units. The majority of systems are split system heat pumps or split system DX cooling with electric heat. All of the units were in good working condition. However, Ameresco Southwest recommends replacement of the Lennox units manufactured in 1985 with new split DX. The new high efficiency units would utilize R410A and therefore the indoor and outdoor units must be replaced. The new equipment would meet ASHRAE 90.1 and/or Energy Star efficiency requirements.

Table I-3. Split System Summary				
Unit	Mfr.	Model	Tons	Age
BLDG A	Carrier	38TRA060310	5	
BLDG A	Trane	2TTB3060A1000AA	5	2007
BLDG A	Trane	2TTB3060A1000AA	5	2007
BLDG A	Lennox	HS16-511U-3P	4	1985
BLDG A	Lennox	HS16-511U-3P	4	1985
BLDG A	Trane	2A7A2048A1000AA	4	2003
BLDG A	Lennox	E16Q4-10-1P	3	
BLDG A	Lennox	HS25-261-1P	2	
BLDG B	Lennox	HS18-311-4P	2.5	1985
BLDG B	Trane	2A7A3060A1000AA	5	2006
BLDG C	Carrier	38TR0303000	2.5	
BLDG D	Ruud	UPMC-036JAZ	3	2002

There are two packaged rooftop heat pumps located at the complex. These units are identified in Table I-4. Both units are in good working condition.

Table I-4. Package Heat Pump Summary				
Unit	Mfr.	Model	Tons	Age
BLDG A	Rheem	RQNL-B036JK	3	2009
BLDG D	Trane	WCC042F100BG	3.5	2004



## 5.10. ROOSEVELT SHERIFF'S SUBSTATION

Highway 188, Milepost 243.3.



Table J-0. Facility Facts	
ROOSEVELT SUBSTATION	
Year Constructed	1994
Additions Constructed	N/A
Square Feet	6,767

The Roosevelt Sheriff's Substation is located at Roosevelt Lake. The substation is used on an intermittent basis as need to provide services for the lake and surrounding area. The building occupies 6,767 square feet.

The following Standards of Operation table outlines the existing operating hours for the Roosevelt Sheriff's Substation. Where modifications to the current operating schedule are recommended to increase energy efficiency, they will be listed under the 'Proposed' heading.

Table J-1. Standards of Operation					
	Existing		Proposed		
	Lighting Schedule	AHU Schedule	Lighting Schedule	AHU Schedule	Standardized Heat/Cool Setpoint
Roosevelt Substation	Refer to Table 4.2	24-7	Refer to Table 4.2	Occupied On Unoccupied Off	Occupied 68/76 Unoccupied 58/86 W/3 Degree Adj.

### 5.10.1. ROOSEVELT SUBSTATION OVERVIEW

The following provides an overview of the existing systems at the Roosevelt Substation, and include building envelope; lighting; domestic water and water heating; automation and controls; and HVAC air distribution systems.

#### BUILDING ENVELOPE

The building rests on concrete slab. The building envelope is comprised of concrete block construction. The roof is a standing seam metal roof that is blue in color. Exterior doors are typically hollow metal steel or high bay roll up doors. The inside surface of the roof is insulated with R-19 foil back insulation in the conditioned office and administrative areas. The high bay garage area is not heated and the roof in this area is not insulated. Windows



are typically metal frame, dual-pane units that are tinted. Weather stripping was installed in typical locations and appeared in “good” condition.

## LIGHTING

The lighting system at this facility is typically either T-12 fluorescent or a combination of T-12 and T-8 fluorescent lighting. The T-12 fixtures typically use either 40 watt or 34 watt energy savings lamps with magnetic ballasts. The T-8 lighting typically uses 32 watt lamps with standard electronic ballast. Gila County has been replacing the older T-12 technology with newer T-8 fixtures as fixtures fail, but there are still a significant number of T-12 fixtures remaining throughout the facility. Office spaces are equipped with some task lighting for additional light on work surfaces. There are still some incandescent fixtures in storage rooms or equipment rooms but most of the incandescent fixtures have been replaced with compact florescent lamps or fixtures. Exterior lighting is primarily high intensity discharge for area lighting and wall high intensity discharge wall pack fixtures for path and/or building illumination. The HID lighting is made up of Metal Halide and High Pressure Sodium lighting systems. Exit system lighting is a mixture of florescent and LED exit signs. Some old incandescent exit signs were also found during the energy audit.

## DOMESTIC WATER AND WATER HEATING

The existing domestic hot water heating system consists of the unit below in Table J-2.

Table J-2. Water Heating Inventory					
Equipment Name, Model #	Type	Location	Qty	Capacity	Heating Rating
American, E62-40R-045D	Electric	Janitors Closet	1	40 Gal	4.5kW

## BUILDING AUTOMATION AND CONTROLS

This is equipped with an antiquated Steafa DDC system. The controls are a standalone system and do not communicate with the county’s Delta front end computer. The system is used to control the split air conditioning system and VAV boxes. Ameresco Southwest recommends replacement of the control system with new Delta controls that would communicate over the county’s network for remote monitoring and control from the Globe facilities office. Some of the existing field devices including damper actuators could be reused.



## HVAC AIR DISTRIBUTION SYSTEMS

The Roosevelt Substation is equipped with a Carrier VVT system. This is comprised of a 15 ton condensing unit and indoor VVT air handler and five VAV zone with electric reheat coils. Although this system appears to be in good working condition it is characterized by its poor efficiency when compared to a VAV system. Ameresco Southwest recommends replacing the existing VVT system with a true VAV system. The project would replace the existing condensing unit with a new 15 ton high efficiency unit equipped with modulating digital scroll compressors for variable loading. The retrofit would also replace the indoor coil and permanently close and seal the VVT bypass damper. New DDC controls would be installed including a FVD to control fan speed and the new premium efficiency fan motor.

Table J-3. Split System Summary				
Unit	Mfr.	Model	Tons	Age
1	Carrier	38AKS016---521--	15.0	1,994





## 5.11. PAYSON SHERIFF'S OFFICE AND JAIL

108 West Main Street  
Payson, AZ 85541



Table K-0. Facility Facts

PAYSON SHERIFF'S OFFICE & JAIL	
Year Constructed	1963
Additions Constructed	N/A
Square Feet	7,340

The Payson Sheriff's Office and Jail is a single story building that totals 7,340 square feet. The building was originally constructed in 1963. The building serves as the sheriff's office and includes office and administrative areas, dispatch and inmate areas.

The following Standards of Operation table outlines the existing operating hours for the Payson Sheriff's Office and Jail. Where modifications to the current operating schedule are recommended to increase energy efficiency, they will be listed under the 'Proposed' heading.

Table K-1. Standards of Operation

	Existing		Proposed		Standardized Heat/Cool Setpoint
	Lighting Schedule	AHU Schedule	Lighting Schedule	AHU Schedule	
Sheriff's Office and Jail	24/7	24/7	24/7	24/7	Occupied 68/76

### 5.11.1. PAYSON SHERIFF'S OFFICE AND JAIL OVERVIEW

The following provides an overview of the existing systems at the sheriff's office and jail, and include building envelope; lighting; domestic water and water heating; automation and controls; and HVAC air distribution systems.

#### BUILDING ENVELOPE

The building rests on concrete slab. The building envelope is comprised of concrete block construction. The roof is a standing seam metal roof with a brown finish. Exterior doors are insulated steel. Windows are typically metal frame, single-pane units that are not tinted and cannot open. Weather stripping was installed in typical



locations and appeared in poor condition but given the few exterior doors on this building, infiltration is minimal.

## LIGHTING

The lighting system at this facility is typically either T-12 fluorescent or a combination of T-12 and T-8 fluorescent lighting. The T-12 fixtures typically use either 40 watt or 34 watt energy savings lamps with magnetic ballasts. The T-8 lighting typically uses 32 watt lamps with standard electronic ballast. Gila County has been replacing the older T-12 technology with newer T-8 fixtures as fixtures fail, but there are still a significant number of T-12 fixtures remaining throughout the facility. Office spaces are equipped with some task lighting for additional light on work surfaces. There are still some incandescent fixtures in storage rooms or equipment rooms but most of the incandescent fixtures have been replaced with compact florescent lamps or fixtures. Exterior lighting is primarily high intensity discharge for area lighting and wall high intensity discharge wall pack fixtures for path and/or building illumination. The HID lighting is made up of Metal Halide and High Pressure Sodium lighting systems. Exit system lighting is a mixture of florescent and LED exit signs. Some old incandescent exit signs were also found during the energy audit.

## DOMESTIC WATER AND WATER HEATING

The existing domestic hot water heating system consists of the units below in Table K-2.

Table K-2. Water Heating Inventory					
Equipment Name, Model #	Type	Location	Qty	Capacity	Heating Rating
American, FG6140T4003P	Propane	Boiler Room	1	40 Gal	36 MBH
State, SBT100 199 RETA F	Propane	Boiler Room	1	100 Gal	200 MBH

## BUILDING AUTOMATION AND CONTROLS

This building utilizes manual thermostats. Given the 24 hour operation of this facility and the split systems used for heating and cooling, the manual thermostats are acceptable for the application.

## HVAC AIR DISTRIBUTION SYSTEMS

Heating and air conditioning is provided by seven split system heat pumps. The indoor fan coils are also equipped with electric heating coils. All of the equipment appeared to be in good working condition. These units are identified in the following table.



Table K-3. Split Heat Pump Summary				
Serves	Mfr.	Model	Tons	Age
1	Trane	TTA060A300B0	5	1991
2	Trane	TTA060A300B0	5	1991
3	Trane	TTA060A300B0	5	1991
4	Trane	TTA060A300B0	5	1991
5	Trane	TTA060A300B0	5	1991
6	Ruud	UAKA-024JAZ	2	1999
7	Ruud	UPMC-048JAZ	4	2000

The Payson Sheriff's Office and Jail are also equipped with two propane fired boilers and hot water pumps as shown below. The boilers and pumps appeared to be in good condition.

Table K-4. Boiler Summary				
Unit	Mfr.	Model	Input	Output
B-1, 2	Raypak	H1-0333B-CARBAA	333 MBH	266.4 MBH

Table K-5. Pump Summary			
Unit	Mfr.	Model	HP
P-1	Dunham	A908I-1-2HP-BXD-3	2.0
P-2	Mepco	RC07-12-020-17-3	2.0



## 5.12. PAYSON PUBLIC WORKS

608, 610 Highway 260  
Payson, AZ 85541



Table L-0. Facility Facts	
PAYSON PUBLIC WORKS	
Year Constructed	NA
Additions Constructed	N/A
Square Feet	6,500

The Payson Public Works facility is a single story building that totals 6,500 square feet. This building serves several county departments including Community Development, District 1 Supervisor, County Manager, Public Works, Engineering and the IT Department.

The following Standards of Operation table outlines the existing operating hours for the Payson Public Works building. Where modifications to the current operating schedule are recommended to increase energy efficiency, they will be listed under the 'Proposed' heading.

Table L-1. Standards of Operation					
	Existing		Proposed		
	Lighting Schedule	AHU Schedule	Lighting Schedule	AHU Schedule	Standardized Heat/Cool Setpoint
Public Works	Refer to Table 4.2	6a to 5p M-F	Refer to Table 4.2	6a to 5p M-F	Occupied 68/76 Unoccupied 58/86 W/3 Degree Adj.

### 5.12.1. PAYSON PUBLIC WORKS OVERVIEW

The following provides an overview of the existing systems at the Payson Public Works building, and include building envelope; lighting; domestic water and water heating; automation and controls; and HVAC air distribution systems.



## BUILDING ENVELOPE

The building has an unconditioned crawl space. The building envelope is wood framed construction with wood exterior and insulated stud walls. The roof is of composition shingles. Exterior doors are typically single pane glass. The attic space is covered with approximately 6" of loose fill insulation. Windows are typically metal frame, dual-pane units. Weather stripping was installed in typical locations and appeared in "good" condition.

## LIGHTING

The lighting system at this facility is typically either T-12 fluorescent or a combination of T-12 and T-8 fluorescent lighting. The T-12 fixtures typically use either 40 watt or 34 watt energy savings lamps with magnetic ballasts. The T-8 lighting typically uses 32 watt lamps with standard electronic ballast. Gila County has been replacing the older T-12 technology with newer T-8 fixtures as fixtures fail, but there are still a significant number of T-12 fixtures remaining throughout the facility. Office spaces are equipped with some task lighting for additional light on work surfaces. There are still some incandescent fixtures in storage rooms or equipment rooms but most of the incandescent fixtures have been replaced with compact florescent lamps or fixtures. Exterior lighting is primarily high intensity discharge for area lighting and wall high intensity discharge wall pack fixtures for path and/or building illumination. The HID lighting is made up of Metal Halide and High Pressure Sodium lighting systems. Exit system lighting is a mixture of florescent and LED exit signs. Some old incandescent exit signs were also found during the energy audit.

## DOMESTIC WATER AND WATER HEATING

The existing domestic hot water heating system consists of the unit below in Table L-2. There was one additional point of use water heater located under the restroom counter. The unit had no nameplate but was approximately a 5 gallon electric unit.

Table L-2. Water Heating Inventory					
Equipment Name, Model #	Type	Location	Qty	Capacity	Heating Rating
State, CD5 30 20RS1	Electric	Janitor's Closet	1	30	4.5kW

## BUILDING AUTOMATION AND CONTROLS

This building is equipped with a functioning Delta DDC system. The system is used to control four gas furnaces located in the attic space and four split condensing units. The control system appears to be in good working condition.

## HVAC AIR DISTRIBUTION SYSTEMS

The heating/cooling distribution system is provided by four gas furnaces located in the attic space. There are also four split condensing units. Note that the furnaces did not have accessible nameplates but appeared to be in good condition. The condensing units were generally found to be in good condition and are shown in Table L-3.



Table L-3. Split System Summary				
Unit	Mfr.	Model	Tons	Age
1	Goodman	CE-60-3B	5.0	1994
2	Goodman	CK 48-3C	4.0	1994
3	Goodman	CK 48-3C	4.0	1994
4	York	E!RA060S25H	5.0	1997



### 5.13. PAYSON TRANSPORTATION OFFICE

Highway 260  
Payson, AZ 85541



Table M-0. Facility Facts	
TRANSPORTATION OFFICE	
Year Constructed	NA
Additions Constructed	N/A
Square Feet	2,250

The Payson Transportation Office is a single story building that totals approximately 2,250 square feet. This building serves the county road department.

The following Standards of Operation table outlines the existing operating hours for the Payson Transportation Office. Where modifications to the current operating schedule are recommended to increase energy efficiency, they will be listed under the 'Proposed' heading.

Table M-1. Standards of Operation					
	Existing		Proposed		
	Lighting Schedule	AHU Schedule	Lighting Schedule	AHU Schedule	Standardized Heat/Cool Setpoint
Transportation Office	Refer to Table 4.2	24-7	Refer to Table 4.2	24-7	Occupied 68/76 Unoccupied 58/86

#### 5.13.1. PAYSON TRANSPORTATION OFFICE OVERVIEW

The following provides an overview of the existing systems at the Payson Transportation Office, and include building envelope; lighting; domestic water and water heating; automation and controls; and HVAC air distribution systems.

##### BUILDING ENVELOPE

The building is slab on grade. It is an engineered steel structure with steel framing, beams and exterior sheathing. The interior walls and ceiling have approximately 4" fiberglass insulation with a vinyl moisture barrier. Windows are typically metal frame, dual-pane units with a reflective film on the east facing office windows. The high bay roll up door is also insulated. Weather stripping was installed in typical locations and appeared in "good" condition.



## LIGHTING

The lighting system at this facility is typically either T-12 fluorescent or a combination of T-12 and T-8 fluorescent lighting. The T-12 fixtures typically use either 40 watt or 34 watt energy savings lamps with magnetic ballasts. The T-8 lighting typically uses 32 watt lamps with standard electronic ballast. Gila County has been replacing the older T-12 technology with newer T-8 fixtures as fixtures fail, but there are still a significant number of T-12 fixtures remaining throughout the facility. Office spaces are equipped with some task lighting for additional light on work surfaces. There are still some incandescent fixtures in storage rooms or equipment rooms but most of the incandescent fixtures have been replaced with compact florescent lamps or fixtures. Exterior lighting is primarily high intensity discharge for area lighting and wall high intensity discharge wall pack fixtures for path and/or building illumination. The HID lighting is made up of Metal Halide and High Pressure Sodium lighting systems. Exit system lighting is a mixture of florescent and LED exit signs. Some old incandescent exit signs were also found during the energy audit.

## DOMESTIC WATER AND WATER HEATING

The existing domestic hot water heating system consists of the unit below in Table M-2.

Table M-2. Water Heating Inventory					
Equipment Name, Model #	Type	Location	Qty	Capacity	Heating Rating
US Craftmaster, E2E30HD045V	Electric	Closet	1	30	4.5kW

## BUILDING AUTOMATION AND CONTROLS

This building is equipped with a manual thermostat for each of the two packaged units.

## HVAC AIR DISTRIBUTION SYSTEMS

The heating/cooling distribution system is provided by two packaged units that are ground mounted. One of the packaged units is propane fired. One of the units is a packaged heat pump. Both were generally found to be in good condition and are shown in Table M-3.

Table M-3. Packaged Unit Summary				
Unit	Mfr.	Model	Tons	Age
1	Ruud	URKA-A042JK08E	3.5	1996
2	BDP	657ANX024000ABAD	2.0	1999





## 6.0 ENVIRONMENTAL BENEFITS






Gila County will realize a carbon footprint reduction by implementing projects that reduce fossil fuel consumption. Electrical generation uses fossil fuel and fossil fuels are also used directly for heating processes. Below is an example of what will be used to document the environmental benefits associated with each building's recommended improvements.

Table 6-0. Environmental Benefits					
By reducing your energy use it indirectly lowers energy production at the source. A great deal of the energy, which is consumed your facility(s), is produced by power plants burning fossil fuels. The burning of these fuels contributes to environmental contamination.					
According to the United States Environmental Protection Agency, and other groups it can be calculated just how much of the pollutants can be reduced or eliminated based on the amount of energy that is saved. This information differs by area based on several conditions. Below are the most recent factors based on the current generating methods and fuels.					
Annual kWh saved through project implementation:			844,102		
Annual therms saved through project implementation:			6,799		
Type Of Pollution	Health Effect	Environmental Effect	Reduction / kWh	Reduction / Therm	Pollutants Reduced
Greenhouse Gasses (CO <sub>2</sub> )	Can cause respiratory and other health problems, particularly in children and the elderly.	Climate change on a global scale has been attributed to increased emissions of carbon dioxide (CO <sub>2</sub> )	1.657 pounds / kWh	12.5 pounds / therm	1,483,665 lbs (CO <sub>2</sub> ) reduced
Volatile Organic Compounds (VOC)	Ozone (smog) effects, cancer and other serious health problems	Ozone (smog) effects plants life included vegetation damage.	0.000061 pounds / kWh	.0005 pounds / therm	55 lbs (VOC) reduced
Nitrogen Oxides (Nox)	Lung damage, respiratory illness, ozone (smog) effects.	Acid rain also causes buildings, statues and monuments to deteriorate.	0.001523 pounds / kWh	.014 pounds / therm	1,381 lbs (NOx) reduced
Carbon Monoxide (CO)	Reduces ability of blood to bring oxygen to body cells and tissues.	One of the six "criteria pollutants" the US EPA tracks related to power production reduces environmental quality	0.00041 pounds / kWh	.0019 pounds / therm	359 lbs (CO) reduced
Sulfur Dioxide (SO <sub>2</sub> )	Respiratory illness, breathing problems, may cause permanent damage to lungs.	Precursor of acid rain, which can damage trees, lakes, and soil; aerosols can reduce visibility.	0.000956 pounds / kWh	.0001 pounds / therm	808 lbs (SO <sub>2</sub> ) reduced
Particulates (PM10)	Eye, nose, and throat irritation; lung damage; bronchitis, cancer, early death	Source of haze which reduced visibility. Ashes, smoke, soot and dust can dirty and discolor structures	0.00002 pounds / kWh	.0004 pounds / therm	20 lbs (PM10) reduced
Mercury (Hg)	Liver, kidney, and brain damage; neurological and development damage	Accumulates in the food chain.	0.003404 milligrams / kWh	0 or negligible pounds / therm	2,873 Mg of (Hg) reduced
Saving 10,000 kWh is equivalent to the CO <sub>2</sub> emissions avoided by taking 1.3 cars off the road for a year, not burning 808 gallons of gas, emissions from .94 of a typical home, sequestered from planting 182 tree seedlings and letting them grow 10 years, or			Removing	146	cars from the road / year
			Or Not Burning	84,300	Gallons of gas / year
			Or saving enough energy to power	104	typical american homes for a year
			Or the annual environmental benefit of this project is equivalent to planting and growing for 10 years	20,866	trees / year
			Or Avoiding the greenhouse gas emissions by not landfilling	261	tons of waste / year

Sources: [www.cleanerandgreener.org](http://www.cleanerandgreener.org)  
<http://www.epa.gov/cleanenergy/energy-resources/calculator.html>



Table 6-1. Environmental Impact		
Type of Pollution	Pollutants Reduced	
Carbon Dioxide (CO <sub>2</sub> ) Eliminated:	1,483,665	Pounds (lbs)
Sulfur Dioxide (SO <sub>2</sub> ) Eliminated:	808	Pounds (lbs)
Nitric Oxide (NO <sub>x</sub> ) Eliminated:	1,381	Pounds (lbs)

Table 6-2. Reduction Equivalents	
Reduction is Equivalent to the...	
	annual greenhouse gas emissions from removing <b>146</b> passenger cars from the road, <u>or</u>
	CO <sub>2</sub> emissions from <b>84,300</b> gallons of gasoline consumed per year, <u>or</u>
	CO <sub>2</sub> emissions from the energy use of <b>104</b> typical American homes for one year, <u>or</u>
	planting and growing <b>20,866</b> trees per year for 10 years, <u>or</u>
	greenhouse gas emissions avoided by not landfilling <b>261</b> tons of waste.



## 7.0 MEASUREMENT AND VERIFICATION

### 7.1. INTRODUCTION

Ameresco Southwest provides an energy savings guarantee on most projects it constructs. This guarantees that Gila County will receive the energy cost and operational savings agreed upon in the IGA, as long as Gila County maintains and runs the equipment as set out in the Investment Grade Audit (IGA). Measurement & Verification (M&V) Reports are completed by Ameresco Southwest or a qualified provider that calculate the level of energy savings being achieved by the project. In the event that the M&V Report does not verify the guaranteed savings in accordance with the M&V Plan, then Ameresco Southwest, or its subcontractor, shall repair, replace, or substitute the Energy Conservation Measure (ECM) that is not performing at the required level, as identified in the M&V Report. If the sum of the ECMs indicates that the Expected Project Savings are exceeded, then no remedy may be needed. Ameresco Southwest or its subcontractor shall re-perform the relevant M&V work for the affected ECM(s) and amend or supplement the M&V Report. If the M&V Report demonstrates that the Work will achieve one hundred percent (100%) of the Expected Project Savings, then Ameresco Southwest shall have satisfied the energy performance guarantee obligations for the length of the reporting period and Gila County shall accept the M&V Report.

The length of the guarantee and the number of M&V reports required is based upon Gila County preference and state legislative requirements. The cost for the first M&V and commissioning report is included in the total cost of the project. This includes pre-retrofit measurements, post-retrofit measurements and a final Measurement and Verification report for Gila County. Average M&V costs are usually one percent of the total project cost. Should Gila County elect to have additional reports it would be necessary to sign an additional service agreement that will cover the cost of the additional M&V reports.

The cost of various M&V approaches is balanced against the size of the investment and the savings risk. The development of the M&V plan is based on the IPMVP-2001 (International Performance Measurement and Verification Protocol), the FEMP-1996 (Federal Energy Management Protocol NTIS Publication DE96-000521) and the application of sound engineering and business guidelines to the overall need for verification of energy savings for each ECM. This plan contains methodology that shall cost effectively provide reasonable assurance of equipment savings through stipulated values, short term or spot measurements, and engineering calculations and/or modeling. The necessary components to a well-established M&V Plan are:

- Specific identification of each ECM and proposed M&V. Reporting requirements for overall savings.
- Participation of all parties and any necessary coordination with independent review.

Methods of M&V vary in accordance with the type of project, level of assurance of savings, cost, and availability of data, financing constraints, and energy costs. The methods selected must be cost effective given the financial savings to Gila County. The methods used for the ECMs detailed herein were selected to minimize M&V cost while still providing a reasonable assurance of the savings calculations. The table below contains the M&V options selected for the ECMs.



Table 7-0. M&V Matrix									
Location	Lighting/ Lighting Controls	Water Retrofit	Direct Digital Controls	HVAC Replacement	Economizer Retrofit	Boiler Replacement	DHW Replacement	VAV Retrofit	Programmable Thermostats
<b>GLOBE FACILITIES</b>									
Courthouse	A	S	D		S				
Sheriff & Jail	A	A	D	D	D	D	D		
Women's Dorm	A	S							
Juvenile Detention Center	A	S			S				
Guerrero Complex	A	S		A	S				
Central Heights Complex	A	S	S						
Fairgrounds (Exhibit Hall Only)	A	S							
New Operations Facility	A								
Michaelson Building	A	S		A	S				S
<b>PAYSON FACILITIES</b>									
Payson Complex	A	S	S						
Roosevelt Substation	A	S	D	D				D	
Sheriff's Office	A	S					S		
Public Works	A	S							
Transportation	A								

The IPMVP-2001 guideline provides the following options related to methodology for M&V:

### OPTION A – PARTIALLY MEASURED RETROFIT ISOLATION

Option A uses a combination of stipulated and measured factors to calculate baseline usage and savings associated with the ECM. Spot or short-term measurement would be used for the measured values. Stipulated values are supported by Gila County input, historical data, or manufacturer data.

- Baseline and savings calculations are provided through engineering calculations, component or system models.
- Depending on number of points measured, Option A provides the least cost alternative to M&V.
- Examples of ECMs where we would use Option A are:
  - Lighting
  - New Package or Split Units, HVAC

### OPTION D – CALIBRATED COMPUTER SIMULATION

Option D uses computer-modeling techniques to provide an engineering model of component and/or system performance. The inputs to the computer simulation may be made by engineering estimates, short or long term measurements, and utility or other metered data. Once the model is properly calibrated it is used for the establishment of the baseline and savings by changing appropriate inputs.

- Baseline is established through a calibration process for the computer modeling. Appropriate measurements and inputs are reflected against regression analysis for the metered data.



- Once the model is calibrated and the baseline established, inputs are varied for the proposed ECM to establish savings.
- Cost of this method varies based on the complexity and accuracy of model desired, availability of data and overall measurement required.
- Examples of ECMs where we would use Option D are:
  - DDC Controls, Larger Systems
  - Cooling Tower Replacement

### **OPTION S – STIPULATED SAVINGS**

Option S entirely uses stipulated factors to calculate baseline usage and savings associated with the ECM. Stipulated values are supported by customer input, historical data, or manufacturer data. The savings can then be calculated by computer building simulations or engineering calculations.

- Examples of ECMs where we would stipulate the saving are:
  - Programmable Thermostat
  - VendingMisers®
  - Computer Power Management
  - Building Envelope
  - Water Efficiency



## 8.0 COMMISSIONING

### 8.1. OVERVIEW

#### 8.1.1. ABBREVIATIONS

The following are common abbreviations used in this document.

<b>DE</b> – Design Engineer	<b>FT</b> – Functional Performance Test
<b>CA</b> – Commissioning Authority	<b>Mfr</b> – Manufacturer/Supplier
<b>CC</b> – Controls Contractor	<b>MC</b> – Mechanical Contractor
<b>Cx</b> – Commissioning	<b>O&amp;M</b> – Operations and Maintenance
<b>Cx Plan</b> – Commissioning Plan Document	<b>PC</b> – Pre-Functional Checklist
<b>EC</b> – Electrical Contractor	<b>PM</b> – Ameresco Southwest Project Manager
<b>ECM</b> – Energy Conservation Measure	<b>CM</b> – Ameresco Southwest Construction Mgr
<b>TC PM</b> – Owner Project Manager	<b>Subs</b> – Subcontractors to Ameresco Southwest

#### 8.1.2. PURPOSE OF THE COMMISSIONING PLAN

- Provide direction for the development of the **Cx** specifications by the **DE** during the latter part of the design phase.
- Provide direction for the commissioning process during construction, particularly providing guidance for resolving problem issues and providing details that were not fully developed during design such as scheduling, participation of various parties of this particular project, actual lines of reporting and approvals, coordination, finalizing functional tests, etc.

This plan does not provide a detailed specification of required testing procedures. The detailed testing requirements and procedures would be included in the Project Specifications. Additional details regarding functional and pre-functional testing would be developed during construction when start-up sequencing is better understood.

#### 8.1.3. COMMISSIONING SCOPE

Commissioning is a systematic process of ensuring that all completed ECMs perform according to the design intent and owner's operational needs. Commissioning during construction of this project is intended to achieve the following specific objectives:

- Ensure that applicable equipment and systems are received as specified and installed properly and receive adequate operational checkout by the installing contractors prior to being put into operation.
- Verify and document that equipment and systems are performing properly and fulfill the contract intent.
- Ensure that **O&M** and record documentation are complete.
- Ensure that Owner's operating personnel are adequately trained.



#### 8.1.4. COMMISSIONED SYSTEMS

The following systems could be commissioned in this project:

- Lighting Retrofits interior and exterior
- Lighting Controls
- HVAC Replacement
- Economizer Control
- Boiler Replacement
- DHW Replacement
- DDC Addition/Retrofit
- VAV Retrofit

#### 8.2. CX TEAM DATA (PRIMARY PARTIES)

Table 8-0. Commissioning Team Data					
Team Member	Company and Contact Names	Office Phone	Mobile Phone	Fax	Email
<b>Owner/CCI PM</b>					
<b>Construction Manager</b>					
<b>Project Manager</b>					
<b>Commissioning Authority</b>					
<b>Design Engineer</b>					
<b>Mechanical Contractor</b>					
<b>Electrical Contractor</b>					
<b>Controls Contractor</b>					

##### 8.2.1. ROLES AND RESPONSIBILITIES

The members of the commissioning team could consist of the **TC PM**, Ameresco Southwest **CM/PM, CA, DE** and an assigned representative of the **MC, EC, CC** and any other installing sub or supplier of equipment.

##### 8.2.2. GENERAL MANAGEMENT PLAN

The **CA** could be provided by Ameresco Southwest for this project. In general, the **CA** coordinates the commissioning activities. The **CA's** responsibilities including all other contractors' commissioning responsibilities would be detailed in the specification developed and issued for the project. The specifications would take contractual precedence over the **Cx** plan. All members work together to fulfill their contracted responsibilities and meet the objectives of the Contract documents. Refer to the management protocols in Section 8.3.5.



### 8.2.3. GENERAL DESCRIPTION OF ROLES

**CA:** Coordinates the **Cx** process, reviews and comments on the specifications and tests and verifies performance tests.

**CM:** Facilitates the **Cx** process, approves test plans and signs-off on performance.

**Subs:** Demonstrates proper system performance, comments on proposed pre-functional and functional tests, conducts and documents pre-functional inspection and functional tests and conducts training.

**DE:** Writes specifications including commissioning requirements, prepares all required drawings, answers RFIs, writes addendums to specifications, reviews submittals, performs construction observation, approves **O&M** manuals, assists in resolving problems and participates, as required, in training.

**PM:** Facilitates and supports the **Cx** process and gives final approval of the **Cx** work.

**Mfr:** The equipment manufacturers and vendors provide documentation to facilitate the commissioning work, perform contracted startup and participate in training.

## 8.3. COMMISSIONING PROCESS

### 8.3.1. COMMISSIONING SCOPE MEETING

A commissioning scope meeting could be planned and could be conducted by the **CA** within 30 days of the beginning of construction. In attendance could be representatives of **MC, CM, CA, PM, DE, MC, EC** and **CC**. At the meeting commissioning parties would be introduced, the commissioning process reviewed and management and reporting lines confirmed. The flow of documents and which submittal data would be required by the **CA** would be discussed. The **Cx** Plan would be reviewed, process questions addressed, lines of reporting and communications determined and the work products list discussed. Also discussed would be the general list of each party's responsibilities, who is responsible to develop the startup plan for each piece of equipment and/or system, and the proposed commissioning schedule. The outcome of the meeting is intended to be increased understanding by all parties of the commissioning process and their respective responsibilities. The meeting provides the **CA** additional information needed to finalize the **Cx** Plan, including the commissioning schedule.

### 8.3.2. FINAL CONSTRUCTION PHASE COMMISSIONING PLAN

The **Cx** Plan for the Construction Phase would be finalized during the project construction after actual startup sequencing/phasing is understood.

### 8.3.3. SITE OBSERVATION

The **CA, DE** and the Owner's **PM** could make periodic visits to the site to witness equipment and system installations.





#### 8.3.4. MISCELLANEOUS MEETINGS

The **CA** is planned to attend selected planning and jobsite meetings in order to remain informed on construction progress and to update parties involved in commissioning. The **CM** and **PM** would provide the **CA** with information regarding substitutions, RFIs, change orders and any **DE** supplemental instructions that may affect commissioning of equipment, systems or the commissioning schedule. The **CA** may review construction meeting minutes, change orders and/or **DE** supplemental instructions for the same purpose.

Later during construction, necessary meetings between various commissioning team parties would be scheduled by the CA through the CM as required.

#### 8.3.5. MISCELLANEOUS MANAGEMENT PROTOCOLS

Table 8-1. Miscellaneous Management Protocols	
Changes in Specified Sequences of Operation	Protocol
For requests for information (RFI) or formal documentation requests:	The CA goes first through the CM.
For minor or verbal information and clarifications:	The CA goes direct to the informed party.
For notifying contractors of deficiencies:	The CA documents deficiencies through the CM, but may discuss deficiency issues with contractors prior to notifying the CM.
For scheduling functional tests or training:	The CA may provide input for and do some coordination of training and testing, but scheduling and content shall be coordinated by the CM.
For scheduling commissioning meetings:	The CA selects the date and schedules through the CM.
For making a request for changes to the scope of the contract documents:	The CA may recommend changes to the Owner's PM who shall authorize or reject them. The CA has no authority to issue change orders.
Changes in specified sequences of operation:	The CA may not make changes to the specified sequences without approval from the DE.
Subs disagreeing with comments or interpretations by the CA shall:	Try and resolve with the CA first, then work through the PM who will work with the CA directly or through the CM to resolve the situation

#### 8.3.6. PROGRESS REPORTING AND LOGS

At the beginning of construction, the **CM** would provide the **CA** with monthly commissioning progress reports. These reports would summarize the commissioning activities of the prior periods. Thirty (30) days prior to startup of the first piece of major equipment or system, the frequency of the progress reports would be increased to twice per month until startup is completed. Thirty (30) days before functional testing begins, weekly progress reports would be provided until functional testing and all non-conformance issues are resolved. The **CM** may increase the reporting frequency as needed. The **CA** can comment on the progress reports which may contain an update of the schedule with a list of requested schedule changes and new items added to the schedule, a list of new and outstanding deficiencies, a description of commissioning activities planned and



results to date, commissioning documentation, etc. The **CA** would keep a log of all commissioning related issues that require current or future attention and the **CA** would track the status of documentation and testing for each piece of equipment and/or system. The “Issues Log” should be sent to the **CM** by the **CA** on an as needed basis.

The **CA** would regularly communicate with all members of the commissioning team, keeping them apprised of commissioning progress and scheduling issues through memos, progress reports, etc.

### **8.3.7. INITIAL SUBMITTALS AND DOCUMENTATION**

#### **8.3.7.1. STANDARD SUBMITTALS**

The design team would provide all **Subs** responsible for commissioned equipment with final commissioning documentation requirements for their respective equipment and/or systems through the **CM**. Drafts of the required documentation requirements would be provided within the specifications so that contractors understand and include their **Cx** scope at time of bidding. This equipment commissioning requirement typically includes pre-functional readiness forms, installation and startup procedures, **O&M** data, performance data and control drawings. The **CA** reviews and approves submissions relative to commissioning issues expressed in the contract documents.

#### **8.3.7.2. SPECIAL SUBMITTALS, NOTIFICATIONS AND CLARIFICATIONS**

The **Subs**, **CM/PM or DE** notify the **CA** of any new design intent or operating parameter changes, added control strategies and/or sequences of operation or other change order items that may affect commissioned systems. Thirty (30) days prior to performing owner-contracted tests, **Subs** provide the **CA** full details of the procedures. This should include final coordination between the **MC**, **EC** and **CC** trades.

The submittals to the **CA** do not constitute compliance of submittals for the **O&M** manuals. Documentation requirements for the **O&M** manuals are discussed further herein.

The **CA** may request additional design narrative from the **DE** and from the **CC** depending on how complete the documentation was which was provided with the bid documents. The **CA** may submit written RFIs to contractors through the **CM** or address them directly for clarification as needed.

### **8.3.8. PRE-FUNCTIONAL CHECKLISTS, TESTS AND START-UP**

Pre-functional checklists (PC) are important to ensure that the equipment and systems are installed, connected and operational and that the functional performance testing (FT) may proceed safely and without unnecessary delays. Each piece of equipment should receive pre-functional checkout by the Contractor prior to formal functional performance testing of equipment or systems. Pre-functional checklists are primarily static inspections and procedures to prepare the equipment or system for initial operation (e.g. controls in place, sensors calibrated, etc.). However, some pre-functional checklist items entail simple testing of the function of the component, a piece of equipment or system (e.g. checking rotation of motors, measuring voltage imbalance,



etc.). The word pre-functional refers to before functional testing. Pre-functional checklists augment and are combined with the manufacturer's startup checklist.

The **CM** should obtain, review, approve or reject and forward to the **CA** startup plans from the **Subs** for all systems which are to be commissioned. These plans should include all pre-functional and functional tests and schedules for completing the same. This project requires that the pre-functional procedures and checklists be documented in writing by the installing contractor or technician. The **CA** should verify a specific percentage (as agreed upon with Owner) of the completed pre-functional checklists. In the event that deficiencies are found in the reported checklists the **CM** should direct the appropriate Subcontractor to re-conduct the pre-functional checkout and should re-submit the results.

#### 8.3.8.1. START-UP PLAN

The **CA** should assist the commissioning team members responsible for startup in developing detailed startup plans for all equipment and/or systems.

The following procedures would be used for this project:

- Each subcontractor should adapt and enhance their representative pre-functional checklists (PC) and functional performance testing (FT) procedures.
- The **CM** should obtain startup plans, including final pre-functional and functional test plans from each subcontractor. The CM should review these and forward them with an accurate project schedule to the **CA**, Owner and **DE**.
- The **CA** should review startup plans relative to obtaining manufacturer installation, startup and checkout data, including actual field checkout sheets used by the field technicians.
- The **DE** and Owner should provide review comments to the **CA** who should then consolidate these with his review comments and distribute them back to the **CM** for the **Sub's** requirements as appropriate.

#### 8.3.8.2. EXECUTION OF CHECKLISTS AND START-UP

Four weeks prior to startup, the **Subs** and vendors would schedule startup and initial checkout with the **CM/PM** and **CA**. The startup and initial checkout would be directed and executed by the **Subs** or vendors. The **CA**, Owner and **CM**, if necessary, should observe the procedures for select components or systems and a sampling strategy may be used at the **CA's** discretion.

To document the process of startup and checkout, the site technician performing the line item task should initial and date each procedure in the Startup Plan and should check off items on the pre-functional and manufacturer field checkout sheets as they are completed. Only individuals having direct knowledge of a line item being completed should check or initial the forms.

#### 8.3.8.3. DEFICIENCIES AND NON-PERFORMANCE

The **Subs** should clearly list all outstanding items of the initial startup and pre-functional procedures that were not completed successfully at the bottom of the procedures form or on an attached sheet. The procedures form and deficiencies should be provided to the **CA** and **CM** within two days of test completion. The **CA** should work



with the **Subs** and Vendors to correct and retest deficiencies or uncompleted items involving the **CM** and others as necessary. The installing **Subs** or Vendors should correct all areas that are deficient or incomplete according to the checklists and tests.

#### **8.3.8.4. PHASED COMMISSIONING**

This project would require each Energy Conservation Measure to be independently commissioned. The schedule would dictate the sequence of the commissioning.

#### **8.3.8.5. CONTROLS CHECK-OUT PLAN**

Within 60 days of the scheduled construction phase completion, the Controls Contractor (CC) should develop and submit a written step-by-step plan to the **CA** that describes the process they intend to follow in checking out the control system and the forms on which they would document the process.

All **CA** required controls pre-functional checklists, calibrations, startup and selected functional tests of the system should be completed and approved by the **CA**. The **CC** should execute the tests and trend logs specified and remain on site for assistance for mechanical system functional tests as specified.

### **8.3.9. DEVELOPMENT OF FUNCTIONAL TEST AND VERIFICATION PROCEDURES**

#### **8.3.9.1. OVERVIEW**

Functional testing is the dynamic testing of systems, rather than just components, under various levels of operation. The systems are run through all of the control system's sequences of operation and components are verified to be responding as the sequences specify. The **CA** develops the functional test procedures in a sequential written form, coordinates, oversees and documents the actual testing, which is usually performed by the installing contractor or vendor.

#### **8.3.9.2. DEVELOPMENT OF TESTS**

The specification would provide specific functional testing scope for each piece of commissioned equipment. A draft of the functional and pre-functional testing procedures and process would be found in the specifications.

Functional testing and verification may be achieved by manual testing (persons manipulate the equipment and observe performance) or by monitoring the performance and analyzing the results using the control systems trend log capabilities or by stand-alone data loggers.

### **8.3.10. EXECUTION OF FUNCTIONAL TESTING PROCEDURES**

#### **8.3.10.1. OVERVIEW AND PROCESS**

The **CA** should approve the schedule for functional tests through the **CM/PM** and affected Subs. For any given system, prior to performing functional testing, the **CA** should wait until the pre-functional checklist has been submitted with the necessary signatures, confirming that the system is ready for functional testing. The **CA** should verify the functional testing of all equipment and systems according to the specifications and the **Cx** plan. The Subs should execute and document the tests. The control system should be commissioned before it is used



to verify performance of other components or systems. Testing proceeds from components to subsystems to systems and finally to interlocks and connection between systems.

### 8.3.10.2. DEFICIENCIES AND RETESTING

The **CM** should provide the **CA** with functional testing results for all systems. Corrections of minor deficiencies identified are made during the tests at the discretion of the **CA**. Deficiencies or non-conformance issues should be noted and reported to the **CM**. **Subs** should correct deficiencies and notify the **CA** of the corrections. The Subcontractor should schedule retesting through the **CM**. Decisions regarding deficiencies and corrections would be made by the **CM** and the **Subs**. For areas in dispute, final authority resides with the Owner. The **CA** should recommend acceptance or rejection of each test to the **CM**. The **CM** should give final approval on each test.

### 8.3.10.3. FACILITY STAFF PARTICIPATION

The Owner's facilities operating and maintenance (**O&M**) staff are encouraged to attend and witness the testing process.

### 8.3.11. O&M MANUALS AND WARRANTIES

#### 8.3.11.1. STANDARD O&M MANUALS

The **CM** should obtain written warranties from the equipment manufacturers and contractors, **O&M** manuals from subs and review **O&M** manuals, documentation and as-builts for systems that were commissioned to verify compliance with the specifications. The **CA** should recommend approval and acceptance of these sections of the **O&M** manuals to the **CM**. The **CA** should also review each equipment warranty.

#### 8.3.11.2. COMMISSIONING RECORD

The **CA** would compile, organize and index the following commissioning data by equipment into labeled, indexed and tabbed three ring binders and deliver to the **CM** and to be included with the **O&M** manuals. The format would be as follows:

- Commissioning plan
- Final commissioning report
- Issues log
- Pre-functional and functional test results

### 8.3.12. TRAINING AND ORIENTATION OF OWNER PERSONNEL

#### 8.3.12.1. OVERALL PLAN

After reviewing the specifications and after interviewing facility staff, if necessary, the Owner and **CA** would fill out a table listing all the equipment for which training would be provided.



### 8.3.12.2. SPECIFIC TRAINING AGENDAS

For each piece of equipment or system for which training is provided, the **CA** and **CM** would agree on a training agenda and participants.

### 8.3.12.3. TRAINING RECORD

The **CM** should video tape record the training and log all participants. Copies of the training material, video and attendee log should be provided to Owner.

## 8.3.13. SCHEDULE

### 8.3.13.1. GENERAL ISSUES

The following sequential priorities would be followed:

- Equipment is not “temporarily” started until pre-functional checklist items and all manufacturer’s pre-functional procedures are completed, safeties are in place and system/component operating integrity issues have been addressed.
- Functional testing is not begun until pre-functional, startup and controls are complete.
- The control system and equipment it controls are not functionally tested until all points have been calibrated and pre-functional testing is completed and trend logging completed and approved.

### 8.3.13.2. PROJECT SCHEDULE

Table 8-2. Project Schedule		
Task/Activity	Estimated Start Date	Estimated End Date
Initial scoping meeting and final plan		
Submittals obtained and reviewed		
Begin construction site visits/inspections		
Pre-functional forms developed and distributed		
Startup and initial checkout plans		
Startup and initial checkout executed		
Functional performance tests		
O&M documentation review and verification		
Training and training verification		
Final commissioning report		

## 8.4. COMMISSIONING DOCUMENTS

Commissioning documents, including Pre-Functional and Functional Commissioning Check Sheets, for a number of the recommended Energy Conservation Measures will be provided in the future. This plan does not provide a detailed specification of required testing procedures. The detailed testing requirements and procedures will be included in the Project Specifications. Additional details regarding functional and pre-functional testing will be developed during construction when start-up sequencing is better understood



## 9.0 PROJECT APPROACH

The Construction Management Team is dedicated to safety (of employees, subcontractors and Gila County personnel, visitors and residents), budget, schedule and quality control. This team ensures that the project is implemented as engineered and designed to meet or exceed Gila County's expectations by focusing on the components of project management that determine the success of a project.

The purpose of the Project Approach is to provide an outline of the steps necessary to construct the project. High-level components of the Project Approach follow:

- Prior to the commencement of the Investment Grade Audit, a kick-off meeting is held to include the Project Development Lead; Audit Project Manager; Engineering and Design Lead; and Construction Project Manager. At this time, Gila County expectations and scope of work are clearly defined for the Audit and Construction Teams.
- Upon review of the audit plan and all team members are in concurrence with the scope and deliverables, a kick-off meeting with Gila County's key personnel is arranged to review the approach to the Audit, Gila County expectations and the logistics of the Audit.
- Following the completion of the Investment Grade Audit and Gila County expectation's acceptance of the subsequent proposal to construct the specific Energy Conservation Measures (ECMs), Ameresco Southwest' Construction Team begins the implementation of the Construction Project.
- At the completion of the Construction Project, the Ameresco Southwest Construction Project Manager documents acceptance and Final Completion of the project with Gila County, outlines the warranty process and delivers all pertinent Operations & Maintenance Manuals.

### 9.1. PROJECT ORGANIZATIONAL CHART

- Senior Project Manager: Russell Kennedy
- On-site Lead Construction Manager: TBD
- Construction Management Team: TBD
- Project Engineering Lead: TBD
- Consultants: TBD
- Sub-Contractors and Suppliers Include: TBD

### 9.2. CONSTRUCTION SAFETY & HEALTH

Safety in the workplace is a core value of Ameresco Southwest and is of the highest priority in the performance of construction projects. In addition to Ameresco Southwest' Safety Manual, a copy of which will be provided to Gila County expectations, site specific safety plans will be required from each subcontractor that detail their job hazard analyses as they relate to their respective scope of work and location. Each of the major tasks will be identified and safe work practices will be documented. Periodic training of the subcontractor's personnel onsite will be conducted as required by the subcontractor's designated safety officer. The OSHA 29CFR1926 Construction Standards will be strictly enforced and followed by subcontractors. Applicable requirements of Gila County expectation's safety and security policy will be incorporated into the site specific safety plans and





copies of these will be maintained in the project trailer or office. The Ameresco Southwest Construction Manager will house onsite all subcontractor Material Safety Data Sheets (MSDS) for any pre-approved chemicals or potentially hazardous materials which will be utilized in the performance of the work. All subcontractors will be required to incorporate a fire prevention and protection plan for their construction activities. Weekly safety meetings for all subcontractors will be conducted onsite and documented in the Daily Log. A first aid and blood-borne pathogen kit will be maintained in the job trailer or office for treating any minor cuts or abrasions. In addition to required Federal and State postings, emergency phone numbers and the address of the nearest hospital will be posted in the job site trailer or office.

### **9.3. ONSITE MOBILIZATION (JOB TRAILER(S), OFFICE, STORAGE)**

The job site trailer or Gila County office will contain the OSHA, EEO, Right-to-Work and other required Federal, State and Local posters/notices. The Project Organization Chart with phone numbers will be posted on the wall. A copy of the project scope of work, any plans and specifications will be maintained, as well as the submittal logs, MSDS, Site Specific Safety Plan, permits and licenses, Daily Log, RFI log, and Change Order Log. Any necessary personal protective equipment (PPE) will also be stored in the job site trailer or office for Ameresco Southwest personnel. The most current project schedule will also be posted on the wall. A phone/fax/printer/copier will be set up for project data communication. If necessary, temporary power and a phone/data line will be installed. Portable toilets/wash stations will be set up onsite where the approved site plan permits.

### **9.4. PROJECT DOCUMENTATION**

A Project Documentation Library will be maintained onsite in the job trailer or designated Gila County office used as a base of operations for the Ameresco Southwest Construction Manager. Its purpose is to organize the project data into a manageable system for administering the construction operations. The library will contain copies of Gila County contract; all Ameresco Southwest subcontracts; purchase orders; the Master Project Schedule; safety meeting reports; site specific safety plans; the Daily Project Log; incident reports; a copy of the Ameresco Southwest Safety Manual; weekly Gila County meeting minutes and action items; punch lists; signed substantial and final completion certificates; start-up reports; applicable testing and balancing reports; commissioning reports; operations and maintenance manuals; and any other pertinent project documentation. Other binders or manuals at the site may include: MSDS, RFI Log, Change Order Log, Submittal Log and Equipment Purchase Order Log.

### **9.5. MASTER PROJECT SCHEDULE**

The Master Project Schedule (MPS) is developed during the course of the Investment Grade Audit utilizing Microsoft Project scheduling software. It is finalized after review and approval by Gila County prior to execution of the construction contract, and contains all major milestone completion dates during the life of the project, with subset categories for the activities and tasks that make up each milestone. The Ameresco Southwest Construction Manager is the owner of the MPS; updating it as the work progresses. All subcontractors will have a copy of the MPS, providing the Construction Manager with any schedule change information that may be anticipated as it relates to their scope of work. Gila County facility utility shutdowns and interruptions will be





clearly shown on the schedule and requested in advance so as not to create a greater inconvenience than necessary to accomplish the work. The MPS will be reviewed, and changes made, during the weekly progress meeting with Gila County and all principle subcontractors.

Ameresco Southwest utilizes the Critical Path Method for construction scheduling by integrating realistic construction tasks developed from a proper work breakdown structure with the associated time-phased cost estimates and the personnel/material/ equipment resources needed to perform each task. By applying this method of construction scheduling, Ameresco Southwest is able to: manage the critical path to ensure the project is completed on time, identify potential impacts to the schedule in advance, manage equipment lead-times, procurement and deliveries, direct subcontractors more effectively and control the overall project cost and duration throughout all phases of implementation.

This approach to project scheduling allows Ameresco Southwest' Project Managers, subcontractors, design professionals, and Gila County to utilize the project schedule as a communication tool by relating project activities with intervals, responsibilities, impacts, costs and overall execution versus contractual expectations and documenting such information. In addition, the project schedule serves as a method of demonstrating measured progress and milestones to the original baseline schedule.

To avoid potential problems with the project schedule, Ameresco Southwest utilizes the critical path identified in the project schedule to communicate responsible activities to subcontractors and/or vendors. By communicating the project schedule, each party will know, in advance, their specific role in the project and the impact their role has on subsequent activities.

The project team will utilize the project construction schedule to identify potential schedule impacts early and regularly. When slippage is identified in the overall project schedule, Ameresco Southwest investigates where this slippage derived and works with all relevant parties' to implement solutions and bring the schedule back on track. If a contractor is at fault for such delay in the project, Ameresco Southwest will work with them to develop and institute a recovery plan at the contractor's expense.

## 9.6. ENGINEERED DRAWINGS AND SPECIFICATIONS

Certain portions of the scope of work may require engineered drawings and specifications. The Project Engineering Lead or Sr. Project Manager, depending on the size and complexity of the project, will direct the specific third party engineering resources to provide any stamped drawings and/or specifications necessary to construct the project. The intent is to conduct 30%, 60% and 90% reviews of the design with Gila County and the Engineering and Construction Teams. Some of these reviews may be accomplished during the Investment Grade Audit phase, depending on the scope of work and level of pre-design necessary. Once the drawings and specifications have been accepted by all parties, and approved by Gila County, 100% Issue for Construction (IFC) sets are delivered to Gila County, Ameresco Southwest' Construction Management Team, and appropriate subcontractors so that the specified work may commence.



## 9.7. COMMISSIONING PLAN

The purpose of the Commissioning Plan is to provide direction for the development of the specifications by the design engineer during the design phase. It also provides direction for the commissioning process during construction, particularly providing guidance for resolving problem issues and providing details that were not fully developed during design such as scheduling; participation of various parties of this particular project; actual lines of reporting and approvals; coordination; finalizing functional tests; etc. Commissioning is a systematic process of ensuring that all completed ECMs perform according to the design intent and Gila County's operational needs. Commissioning during construction of the project is intended to achieve the following specific objectives:

1. Ensure that applicable equipment and systems are delivered as specified and installed properly, and receive adequate operational checkout by the installing contractors prior to being put into operation
2. Verify and document that equipment and systems are performing properly and fulfill the contract intent
3. Ensure that O&M Manuals and record documentation are complete
4. Ensure that Gila County's operating personnel are adequately trained.

## 9.8. QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

In general, the purpose of QA/QC is to establish checks and balances to ensure the intended systems are designed with consideration of Gila County's operational needs and maintenance requirements, and that the systems are constructed in a safe and efficient manner. The Commissioning Plan incorporates QA/QC as one of its functions of project oversight. The Construction and Engineering Teams work together to ensure that the subcontractors install new equipment and systems in accordance with the scope of work. They also ensure that the quality of engineering and construction operations is maintained through the life of the project.

## 9.9. CONSTRUCTION PERMITS AND INSPECTIONS

The Ameresco Southwest Construction Manager will review local codes and ordinances to determine what portions of the work, if any, may require permits. This also includes any permits required by Gila County's Facility Management. Typically, this requirement is investigated and confirmed during the Investment Grade Audit phase so that the longest lead times for procurement of permits can be factored into the MPS and not cause a potential delay to the project schedule for completion. Inspections will be scheduled with the appropriate Authority Having Jurisdiction (AHJ) for activities that may include pipe welds, pressure tests, electrical switchgear and component installations, concrete foundations and pads, structural steel erections, etc.

## 9.10. PRE-CONSTRUCTION SUBMITTALS

Submittals will be provided to Gila County for every piece of new equipment to be installed as part of the construction project's scope of work. Once each submittal is reviewed and approved by Gila County and the Ameresco Southwest Engineering Lead or Third Party Engineer, the subcontractor and/or equipment vendor will be notified that the subject equipment has been approved for procurement. A copy of the approved submittals will be kept by the Ameresco Southwest Construction Manager in the onsite trailer or office.



### 9.11. AMERESCO SOUTHWEST'S DIRECT EQUIPMENT PURCHASING

In order to achieve the best possible pricing on major equipment, Ameresco Southwest may purchase direct from the manufacturer. Once selected by the Ameresco Southwest Sr. Project Manager and approved by Gila County, the Ameresco Southwest Manager of Construction Services will approve all purchases of major equipment for the construction project. Equipment logs will be maintained to ensure that new purchases will be tracked for committed lead times to the project site by the manufacturer. As previously stated, submittals will be required for review and approval prior to release of the equipment from the vendor.

### 9.12. PROJECT COST CONTROL AND PAYMENTS

The Ameresco Southwest Construction Manager will closely monitor each subcontractor's daily installation efforts to ensure that Gila County's scope of work is implemented without deviation. Where previously unforeseen circumstances prevent the scope from being installed as specified, or Gila County elects to alter or add to the agreed scope of work, the Ameresco Southwest Construction Manager, Engineering Lead and the subcontractor's project manager will thoroughly investigate opportunities for value engineering in order to avoid or reduce additional costs to construct. As work progresses, the Ameresco Southwest Construction Manager will confirm that subcontractor's installed work is in accordance with the approved scope and/or changes. All submitted project subcontractor and vendor invoices will be reviewed and verified for accuracy by the Construction Manager, then subsequently approved for payment by the Sr. Project Manager. Progress payment invoices from subcontractors will include partial lien releases.

Ameresco Southwest focuses on forecasts to maintain control of project costs. This forecast begins with a budget derived from the contractual construction estimate. This budget is integrated with the construction schedule to apply time phasing for project costs and relevant work breakdown structures. During the construction phase, incurred costs are evaluated against the baseline budget, future commitments and measured progress to predict at-completion costs and allow the Project Manager to make effective decisions to mitigate any cost variances.

Using industry rate standards along with confirmation from local suppliers and subcontractors, Ameresco Southwest puts together a realistic project estimate covering all aspects of the construction process. The budget is subdivided into smaller categories, so that corrective action can be taken whenever budgeted and actual values differ. Corrective actions may be in the form of procedural changes such as value engineering or scope modifications.

### 9.13. AMERESCO SOUTHWEST'S CONSTRUCTION MANAGEMENT

Ameresco Southwest will staff the construction project with an adequate number of experienced employee and contract Construction Managers in relation to the size, logistics, subcontractor work shifts and complexity of the project. Overall onsite management authority for daily construction work will rest with the Lead Construction Manager. He will support and direct the other Construction Managers in the performance of their duties. Depending on the size of the project, the Lead Construction Manager may report to an onsite or offsite Project



Manager, who in turn will report to a Sr. Project Manager. Ultimate responsibility for all Ameresco Southwest construction projects rests with the Ameresco Southwest Manager of Construction Services.

#### **9.14. AMERESCO SOUTHWEST'S SUBCONTRACTOR SUPERVISION**

Ameresco Southwest will maintain an onsite full-time Construction Manager(s) during the construction of the project. The Construction Manager(s) will be responsible for the supervision of our subcontractors and equipment vendors at all times that work is being performed on Gila County's property, ensuring that they follow applicable safety guidelines, security access and escort requirements, and established working hours/shifts. Any and all project related communication from the subcontractors and vendors will come through the Ameresco Southwest Construction Manager. Additionally, the Construction Manager(s) will inspect the subcontractor's work for its compliance with the approved specifications and scope, and that the construction schedule is maintained. All personnel visiting the construction site will be required to sign-in at the Ameresco Southwest jobsite trailer or office, before being allowed to enter the work areas.

#### **9.15. ON-SITE MATERIALS AND EQUIPMENT MANAGEMENT**

All materials and equipment shipped to the site will be inspected and the receipt of same acknowledged on the packing slips. In the case of Ameresco Southwest purchased equipment, the Construction Manager will perform this function; the specific subcontractor purchased equipment will be inspected by both the subcontractor and the Ameresco Southwest Construction Manager. If damage is identified, it will be photo-documented, with details entered into the Daily Log. The Ameresco Southwest or subcontractor's project manager will be notified and a return equipment or material authorization will be secured. The equipment or materials will be returned promptly if they require replacement. Repairs to the materials or equipment by factory-authorized technicians will be made if their assurance of remediation is deemed acceptable and approved by Gila County. Copies of the shipping receipts will be kept in the Project Documentation Library at the jobsite. All of the Ameresco Southwest and subcontractor purchased materials and equipment will be stored in secured areas on or offsite until ready for installation.

#### **9.16. CHANGES IN SCOPE AND GILA COUNTY APPROVALS**

The construction project will be built in accordance with the approved scope of work, including any drawings and specifications. When changes are desired by Gila County, the request to change the scope will be documented in an RFI (request for information) letter from Gila County's Representative to the Ameresco Southwest Construction Manager, in order to clarify the exact scope desired for the requested change. In the case of an RFI from a subcontractor, the same RFI format will also be used, and sent to the Ameresco Southwest Construction Manager, with a copy to the Ameresco Southwest Project Manager. The RFI may include a request for proposal for a change in scope, material, equipment, method, or schedule. The Ameresco Southwest Project Manager will obtain clarification from the Lead Engineer and/or Gila County's Representative, and then issues an RFI response to the subcontractor. An RFI log will be maintained at the site trailer or office, with a copy held at the Ameresco Southwest Project Manager's office. The Ameresco Southwest Lead Engineer will be notified of the changes so that changes to the record documents can be kept current. The Ameresco Southwest Project Manager is responsible for directing any changes in scope.



### 9.17. SUBSTANTIAL COMPLETION AND PUNCH LIST

Substantial Completion is the stage in the progress of the work when the work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that Gila County can occupy or utilize the work for its intended purpose. It is also the date of commencement of applicable warranties required by the Contract Documents. As they approach Substantial Completion, each subcontractor will create a punch list for their scope of work. This will be accomplished through an inspection of the installed work, conducted by the Ameresco Southwest Construction Manager, Gila County's Representative, and the subcontractor's project manager. The punch lists from each subcontractor will be incorporated into the Ameresco Southwest Substantial Completion Certificate to Gila County, in addition to any other outstanding items that Gila County's Representative may have documented. The Ameresco Southwest Construction Manager and Gila County's Representative will then execute the Certificate of Substantial Completion.

### 9.18. GILA COUNTY'S KEY PERSONNEL TRAINING

Trained and informed staff and operation and maintenance personnel can make a difference between energy performance contracting projects that exceed savings targets and those that require continuous program resolution and extra staff. To ensure the performance contracting process is successful, Gila County facilities staff and the Project Team will work together as partners with the common objective of protecting the performance contract investment while optimizing savings. To this end, training will play a critical role in arming the individual facility operations staff with an understanding of every aspect of the program.

Gila County training will be performed by the major equipment vendor representatives and the direct digital controls subcontractor(s) for the installed systems. Training will be scheduled in advance and confirmed with Gila County's designated personnel. All training sessions will be documented with a sign-in sheet that clearly shows those in attendance, the date and time of the training, the training provider and the specific training curriculum covered. Depending on the complexity of the system and/or the practice of the specific trainer, demonstrated practical operation of the system and a knowledge check may be required of Gila County's designated personnel in order to verify a working understanding of the installed system and information covered.

### 9.19. OPERATIONS AND MAINTENANCE MANUALS

As equipment is received at the site, the respective operations and maintenance manuals will be inserted into Gila County's Project O&M Manual Binder(s). Any equipment with moving parts will have a manual. The direct digital controls submittal including point's lists, control component details and the sequences of operation will be included. As-built drawings for installed systems will also be provided for mechanical, electrical and plumbing improvements. The O&M manuals and as-builts will be delivered to Gila County prior to the execution of the Certificate of Final Completion.



## 9.20. EQUIPMENT WARRANTIES

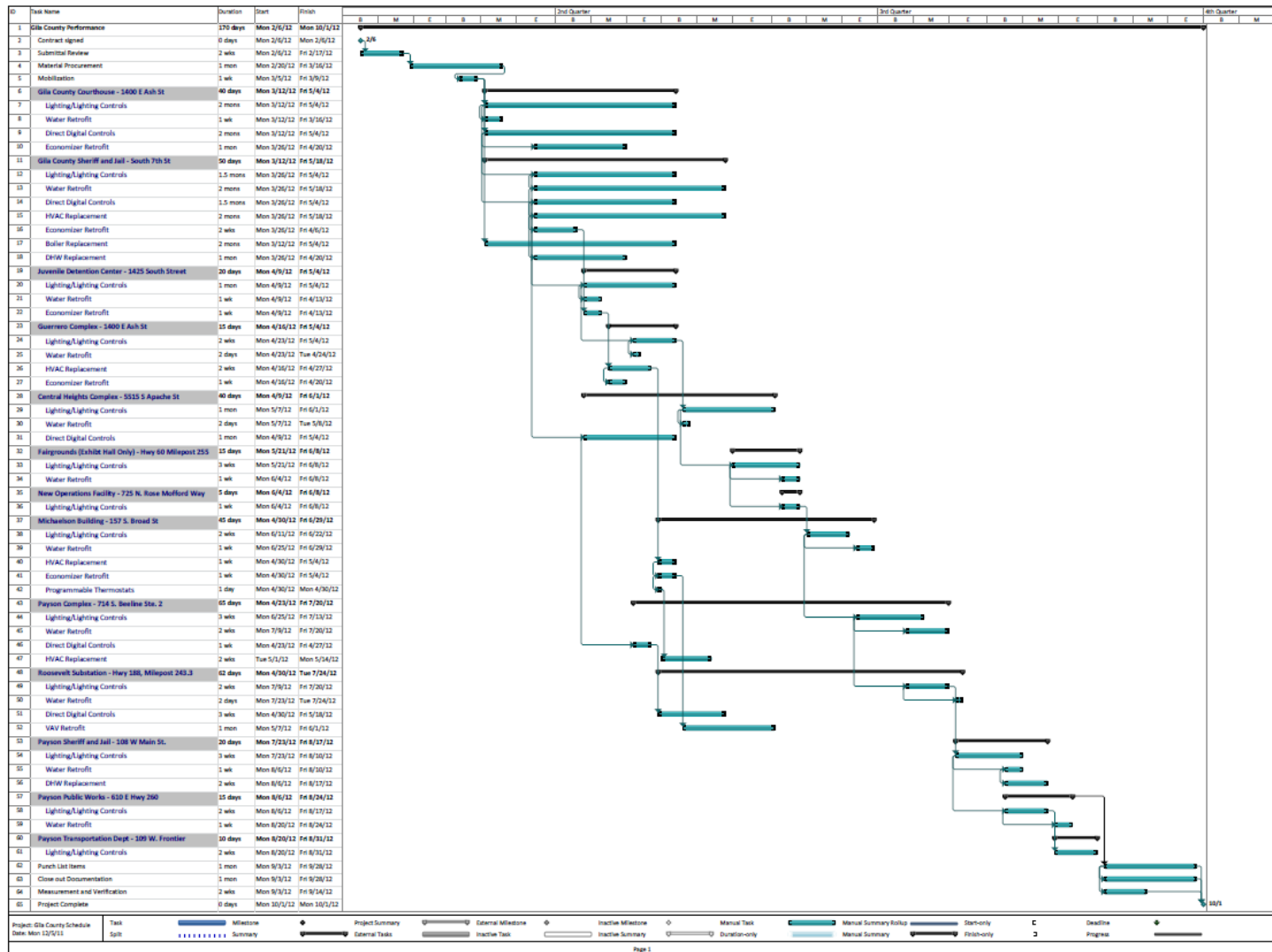
Manufacturer's warranties for new equipment and systems installed as part of the construction project will be provided to Gila County either as part of the O&M Manuals, or separately in the form of a new equipment list showing the start and expiration dates of the applicable warranties.

## 9.21. FINAL COMPLETION AND PROJECT CLOSE OUT

Once all documented punch list items have been accomplished following Substantial Completion, and O&M Manuals, as-builts and equipment warranty information has been delivered to Gila County, the Certificate of Final Completion will be executed by the Ameresco Southwest Construction and Project Managers, and Gila County's Representatives. This officially closes the construction project. Demobilization of the Ameresco Southwest trailer or site office may have already begun as appropriate, or will begin at this time. All Gila County access keys and cards will be returned to and signed for as received by Gila County.



## 10.0 PROJECT SCHEDULE



**EXECUTIVE SUMMARY FORM  
PROFESSIONAL SERVICE AGREEMENT**

**Contract Name:** Technical Energy Audit **Contract No.:** 6557.102/12-2010

**Statement of Purpose and Need (3-5 Sentences)**

APSES (Arizona Public Service Energy Services Co.) will perform a complete investment grade energy audit of the county facilities and provide an Energy Audit Report. Upon report completion the construction agreement phase will be executed at the county's approval. The audit will provide a strategically formulated plan and specific recommendations where investments in energy conservation measures would provide a rapid payback in energy savings for Gila County.

**Contract End Date:** April 4, 2012

**Renewal Option:** ☒ **Yes**  
☐ **No**

**Maximum Dollar Limit:** -

**Contract Information**

**Firm Name:** Arizona Public Service Energy Service Co. **Contact Person:** Leonard Byrd

**Address:** PO Box 53901 MS 1910 **Phone No:** 602-744-5000

**City:** Phoenix **State:** AZ **Fax:** \_\_\_\_\_ **Email:** leonard.byrd@apses.com

**Fund:** ARRA Energy Efficiency Block - Facilities

**Type of Funds:** ☐ **Restricted**  
☐ **Grant**  
☐ **General Fund**  
☐ **Other**

**Fund Code:** 6557.102

**Special Notes:**



Tommie C. Martin, District I  
P.O. Box 2297 Payson, AZ. 85547  
(928) 474-2029

Michael A. Pastor, District II  
1400 E. Ash St. Globe, AZ. 85501  
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Shirley L. Dawson, District III  
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Don E. McDaniel Jr., County Manager  
Phone (928) 425-3231 Ext. 8761

Joseph T. Heatherly, Finance Director  
Phone (928) 425-3231 Ext. 8743

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TTY: 7-1-1

## GILA COUNTY

[www.gilacountyaz.gov](http://www.gilacountyaz.gov)

### PROFESSIONAL AGREEMENT NO. 6557.102/12-2010

#### TECHNICAL ENERGY AUDIT

**THIS AGREEMENT** for the performance of an Investment Grade Energy Audit is entered into as of this 5<sup>th</sup> day of April, 2011, (the "Audit Agreement") by and between the County of Gila, Arizona, whose principal offices are located at 1400 E. Ash St., Globe, Arizona, 85501 (the "Owner") and APS Energy Services Company, Inc., whose principal offices are located at 60 E. Rio Salado Parkway, Suite 1001, Tempe, Arizona, 85281 ("APSES"). APSES and Owner are also referred to individually as ("Party") and collectively as ("Parties").

*Whereas*, the Owner desires for Arizona Public Service Energy Services Company (APSES) to perform a complete investment grade energy audit of the Owners facilities consisting of the collection of data, inspection of facilities, establishment of base year energy consumption, the performance of a financial analysis of energy conservation measures and preparation of a detailed Energy Audit Report which constitutes the third phase of the project. The fourth and final phase of the project consists of the design and installation of energy conservation measures described and recommended in the Energy Audit Report, and approved by the Owner.

*Whereas*, the Owner may choose to apply American Recovery and Reinvestment Act (ARRA) funding to measures identified under this agreement APSES shall evaluate the facilities and plan for compliance with the requirements of the ARRA funding.

*Now*, therefore, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Owner and APSES agree as follows:

#### **ARTICLE I – SCOPE OF SERVICE:** The technical Energy Audit.

- 1.1 After execution of this agreement (the "Audit Agreement"), APSES will begin conducting a technical energy audit of all Owner facilities (the "Energy Audit"), which will consist of the collection of data,

inspection of Owner's facilities, establishment of base year energy consumption, the performance of a financial analysis of energy conservation measures and the preparation of the detailed Energy Audit Report, which outlines current energy consumptions, recommendations for energy efficient equipment upgrades, and a detailed analysis of implementation costs and energy savings resulting from such improvements. The Energy Audit Report is intended to provide the Owner with the information necessary for the evaluation of the costs and benefits of proceeding with the final phase of the project, which consists of the design and installation of the energy conservation measures.

- 1.2 If the Owner decides to proceed with the design and implementation of the energy conservation measures, as specified in the Energy Audit Report, the Parties shall execute the construction agreement, as it may be mutually amended by the Parties, (the "Construction Agreement"), and the Owner shall provide APSES a notice to proceed ("Notice to Proceed"). The Notice to Proceed is subject to the provisions, limitations, and project criteria set forth in the Energy Audit Report and the provisions of the Construction Agreement. The Owner may not unilaterally change any limitations or provisions of the Construction agreement or the Energy Audit Report in the Notice to Proceed. If the Owner issues the Notice to Proceed within sixty (60) calendar days from receipt of the Energy Audit Report or such time period as Owner and APSES mutually agreed upon, any costs incurred for Energy Audit shall be included in the implementation costs of the energy conservation measures. In the event the Construction Agreement is not executed and the Notice to Proceed is not issued within sixty (60) calendar days from receipt of the Energy Audit Report, the design and implementation costs of the energy conservation measures are subject to price adjustments, and may affect the energy savings established in the Energy Audit Report.
- 1.3 APSES cannot guarantee the energy savings stipulated in the Energy Audit Report if Owner selects another firm for the design and implementation of the energy conservation measures or chooses to implement the energy conservation projects with its own personnel.
- 1.4 Should APSES determine, in its sole discretion, at any time before the completion of the Energy Audit Report that the anticipated energy savings cannot be achieved at Owner's facility, APSES will provide written notice to Owner and cease all further Energy Audit activities, in which case Owner will not be charged for any Energy Audit activities performed by APSES.

**ARTICLE II – PAYMENT:** If the Owner decides not to proceed with the final phase of the Project, Owner shall pay APSES, within thirty (30) calendar days from the date of receipt of an invoice for the performance of the Energy Audit, the amount of Seventeen Thousand Six Hundred Ninety Dollars (\$17,690.00) Late payments shall accrue interest daily at a rate of ten percent (10%) per annum, or the maximum interest rate permitted by law, whichever is less, for each calendar day following the due date until payment is made.

**ARTICLE III – LEGAL ARIZONA WORKERS ACT COMPLIANCE:** APSES hereby warrants that it will at all times during the term of this Contract comply with all federal immigration laws applicable to APSES's employment of its employees, and with the requirements of A.R.S. § 23-214 (A) (together the "State and Federal Immigration Laws"). APSES shall further ensure that each subcontractor who performs any work

for APSES under this contract likewise complies with the State and Federal Immigration Laws. County shall have the right at any time to inspect the books and records of APSES and any subcontractor in order to verify such party's compliance with the State and Federal Immigration Laws.

Any breach of APSES's or any subcontractor's warranty of compliance with the State and Federal Immigration Laws, or of any other provision of this section, shall be deemed to be a material breach of this Contract subjecting APSES to penalties up to and including suspension or termination of this Contract. If the breach is by a subcontractor, and the subcontract is suspended or terminated as a result, APSES shall be required to take such steps as may be necessary to either self-perform the services that would have been provided under the subcontract or retain a replacement subcontractor, (subject to APSES approval if MWBE preferences apply) as soon as possible so as not to delay project completion. APSES shall advise each subcontractor of County's rights, and the subcontractor's obligations, under this Article by including a provision in each subcontract substantially in the following form:

"Subcontractor hereby warrants that it will at all times during the term of this contract comply with all federal immigration laws applicable to Subcontractor's employees, and with the requirements of A.R.S. § 23-214 (A). Subcontractor further agrees that County may inspect the Subcontractor's books and records to insure that Subcontractor is in compliance with these requirements. Any breach of this paragraph by Subcontractor will be deemed to be a material breach of this contract subjecting Subcontractor to penalties up to and including suspension or termination of this contract." Any additional costs attributable directly or indirectly to remedial action under this Article shall be the responsibility of APSES. In the event that remedial action under this Article results in delay to one or more tasks on the critical path of APSES's approved construction or critical milestones schedule, such period of delay shall be deemed excusable delay for which APSES shall be entitled to an extension of time, but not costs.

**ARTICLE IV – LAWS AND ORDINANCES:** This agreement shall be enforced under the laws of the State of Arizona. APSES shall maintain in current status all Federal, State and Local licenses and permits required for the operation of the business conducted by APSES. APSES shall comply with the applicable provisions of the Americans with Disabilities Act (Public Law 101-336, 42 U.S.C. 12101-12213) and applicable federal regulations under the Act.

**ARTICLE V – ANTI-TERRORISM WARRANTY:** Pursuant to A.R.S. §35-397 APSES certifies that it does not have scrutinized business operations in Iran or Sudan and that they are in compliance with the Export Administration Act and not on the Excluded Parties List.

**ARTICLE VI – TERM:** Contract shall commence upon award and be in effect for a period of one (1) year. The County shall have the right at its sole option to extend the contract for one (1) more year if deemed necessary.

**ARTICLE VI – CANCELLATION:** This agreement is subject to cancellation pursuant to A.R.S. § 38-511.

IN WITNESS WHEREOF, three (3) identical counterparts of this Agreement, each which shall include original signatures and for all purposes be deemed an original thereof, have been duly executed by the parties hereinabove named, on the date and year first above written.

PROFESSIONAL AGREEMENT NO. 6557.102/12-2010

TECHNICAL ENERGY AUDIT

GILA COUNTY:

GILA COUNTY BOARD OF SUPERVISORS

APS ENERGY SERVICES COMPANY, INC.

\_\_\_\_\_  
Michael A. Pastor, Chairman, Board of Supervisors

\_\_\_\_\_  
Authorized Signature

ATTEST:

\_\_\_\_\_  
Robert W. Georgeoff  
Print Name

\_\_\_\_\_  
President  
Title

\_\_\_\_\_  
Marian Sheppard, Chief Deputy Clerk of the Board

APPROVED AS TO FORM:

\_\_\_\_\_  
Bryan B. Chambers, Chief Deputy County Attorney  
for Daisy Flores, County Attorney

**Work Session****Meeting Date:** 09/25/2012**Submitted For:** Michael O'Driscoll, Health &  
Emergency Services Division Director**Submitted By:** Jendean Sartain  
Deputy Director of  
Health Services  
Health &  
Emergency  
Services Division**Department:** Health & Emergency Services Division**Division:** Health Services

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InformationRequest/Subject

Discussion regarding federal funding changes to the immunization program which includes delivery and charging for immunizations administered.

Background Information

County and State Health Departments have been receiving federal funding (317 money) to provide immunizations to children from birth through 18 years of age. Effective October 1, 2012, federal funding for the Vaccine For Children (VFC) for the underinsured and insured children will be eliminated. Funding will still be given to cover children with AHCCCS, uninsured, and Native American/Alaskan Natives. This change in federal funding will require health departments around the country to develop immunization programs with their own private vaccine stock (purchased) and charge clients and/or develop a third party billing system to bill insurance for the cost of services and vaccine.

Evaluation

This loss of funding will necessitate the health department to develop an alternative immunization delivery process for the underinsured and insured pediatric population. The health department will no longer be able to provide vaccine to all pediatric residents free of charge.

Conclusion

With the loss of funding, the Health Department is in the process of investigating and developing a private vaccine program to include the following: fee schedules, charging for vaccines, contracting with a third party billing company, vaccine management and inventory controls.

Recommendation

The Director of the Health Department recommends approval of developing an alternative immunization delivery process for the underinsured and insured pediatric population.

Suggested Motion

Information/Discussion regarding funding changes to the immunization program to necessitate the development of a private vaccine program for the underinsured and insured pediatric population. **(Michael O'Driscoll)**

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**Work Session**

**Meeting Date:** 09/25/2012

Submitted For: John Nelson, Deputy County  
Manager/Clerk

Submitted By: Janice Cook,  
Administrative  
Services  
Manager,  
Deputy  
County  
Manager

Department: Deputy County Manager

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Information

Request/Subject

Gila County's list of legislative issues/priorities to be considered at the County Supervisors Association Annual Legislative Summit on October 1-3, 2012.

Background Information

The County Supervisors Association (CSA) will hold its annual Legislative Summit in Sierra Vista October 1-3 at which time Supervisors from all Arizona counties will, by 2/3 majority vote, adopt a list of issues/proposals which will become CSA's 2013 Legislative Agenda to pursue on behalf of Arizona counties. This summit is the opportunity for each county to put its issues and priorities in front of the organization for consideration.

Evaluation

The supervisors from all 15 Arizona counties meet each year at this time to develop their issues/proposals which become the Legislative Agenda for the staff of the County Supervisors Association to pursue in the upcoming legislative session. The summit is a "1 supervisor/1 vote" process; therefore, any supervisor not able to attend the summit should prepare a proxy in order to participate.

Conclusion

The Gila County Board of Supervisors should adopt its list of issues and priorities to take to the annual Legislative Summit to be considered for inclusion in the County Supervisors Association's 2013 Legislative Agenda.

Recommendation

Staff recommends adoption by the Gila County Board of Supervisors of the attached list of issues/proposals to be presented at the County Supervisors Association Annual Legislative Summit and considered for inclusion in CSA's 2013 Legislative Agenda.

Suggested Motion

Information/Discussion/Action to formulate Gila County's list of issues/priorities to be presented at the County Supervisors' Association (CSA) annual summit on October 1-3 in Sierra Vista to be considered by Arizona's county supervisors for inclusion in CSA's 2013 Legislative Agenda.

**(John Nelson)**

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#### Attachments

CSA 2012 Legislative Agenda

CSA Financial Summary

Loss of Lottery Funds

HURF Funding

#1-Card Fees

#2-County Hwy Definition

#3 Fire Code Repeal

#4 Private E-Mail Address

#5-Road Abandonment

#6-County Primitive Roads

#7-Cannabis

#8-Utilities

#9-Annexation of ROW

#11-Child Support

#12-Assistance/Lottery Funds

#13-½¢ Sales Tax

Trans Priv Tax

State Aid-Comm Colleges



## 2013 CSA Legislative Issues & Proposals for Consideration

### 2013 CSA Proposed Principle Policy Directions

**Budget.** Protect and enhance county fiscal situations by continuing opposition to state cost/programmatic shifts and diversion of revenues and advocating for restoration where feasible. Examples include:

- HURF restorations;
- State shared revenue diversion;
- County Assistance Funding restoration;
- SVP funding responsibility back to ASH;
- State administrative and program responsibilities shifted to county funding;
- Governor's TPT Simplification Task Force.

**Local Authorities.** Protect and advance administrative and fiscal authorities necessary to manage county operations to meet local needs and oppose efforts to restrict or diminish board authority and local control, including attempts under the guise of Regulatory "Reform."

### Legislative Submissions Received to Date:

1. *Convenience Fees & Credit/Debit Cards*  
Amend statute to allow counties to charge debit/credit card users a "convenience fee" sufficient to cover the issuing bank transaction charges associated with the electronic payments.  
Submitting County: Mohave County
2. *County Highways*  
Collection of amendments that establish a definition of "county highway," broaden the definition of roadway "maintenance," and includes amendments to the "Primitive Road" designation to permit broader use.  
Submitting County: Mohave County

3. *Fire Code Replacement*  
Permit boards to repeal an adopted Fire Code.  
Submitting County: Yuma County
4. *Protecting Private E-mail Addresses*  
Amend the public records law to prevent a private citizen's email address from being included in public records requests.  
Submitting County: Yuma County
5. *Road Abandonment by Public Vote*  
Eliminate the requirement that property owners must approve the abandonment of a public roadway.  
Submitting County: Cochise County
6. *County Roadways & Primitive Roads*  
Change statute to 1) remove the requirement that private roadways must be part of a subdivision before being integrated into a county road system; and 2) expand the universe of primitive roads to include those opened before 1990.  
Submitting County: Cochise County
7. *Cannabis is not a Crop*  
Exclude cannabis from the definition of "general agricultural purposes," thus subjecting the cultivation of medical marijuana to greater county zoning. Submitting County: Yavapai County

8. *Utilities in the County Rights of Way*  
Grant counties authority to charge fees to all utilities using counties rights of way, similar to municipal authority and existing county authority for telecommunications utilities.  
Submitting County: Pinal County
9. *Annexation of Rights of Ways*  
Amend annexation processes to permit simple transfers of ownership of roadways and rights of ways by mutual consent, avoiding technical requirements and property owners consent and petition process.  
Submitting County: Pinal County
- ~~10. *Flood Control District & County IGA*  
Permit county personnel to undertake construction projects in a flood control district in excess of the statutory \$5000 threshold, when an IGA is in place with the county.  
Submitting County: Pinal County~~
11. *Child Support Collections*  
Restore the ability to use State Shared Retained Earnings (AARE) as matching funds at the federal level and protect against the state forcing an unfunded collection mandate to the county level.  
Submitting County: Navajo County
12. *County Assistance Fund*  
Restore County Assistance Fund lottery dollars to their historic level for every county.  
Submitting County: Navajo County



13. *Half-Cent Sales Tax*

Pending submission, give counties an additional half-cent sales tax authority via stringent voting requirements – either a vote of the peoples or unanimous vote of the Board.

Submitting County: Navajo County

14. *“Thanksgiving”*

Clarify that counties may offer the Friday after Thanksgiving as a county holiday in exchange for Columbus Day.

Submitting County: Maricopa County

DRAFT



## County Budget Impacts FY2011-2012

These figures include ongoing shifts in addition to proposed increases.

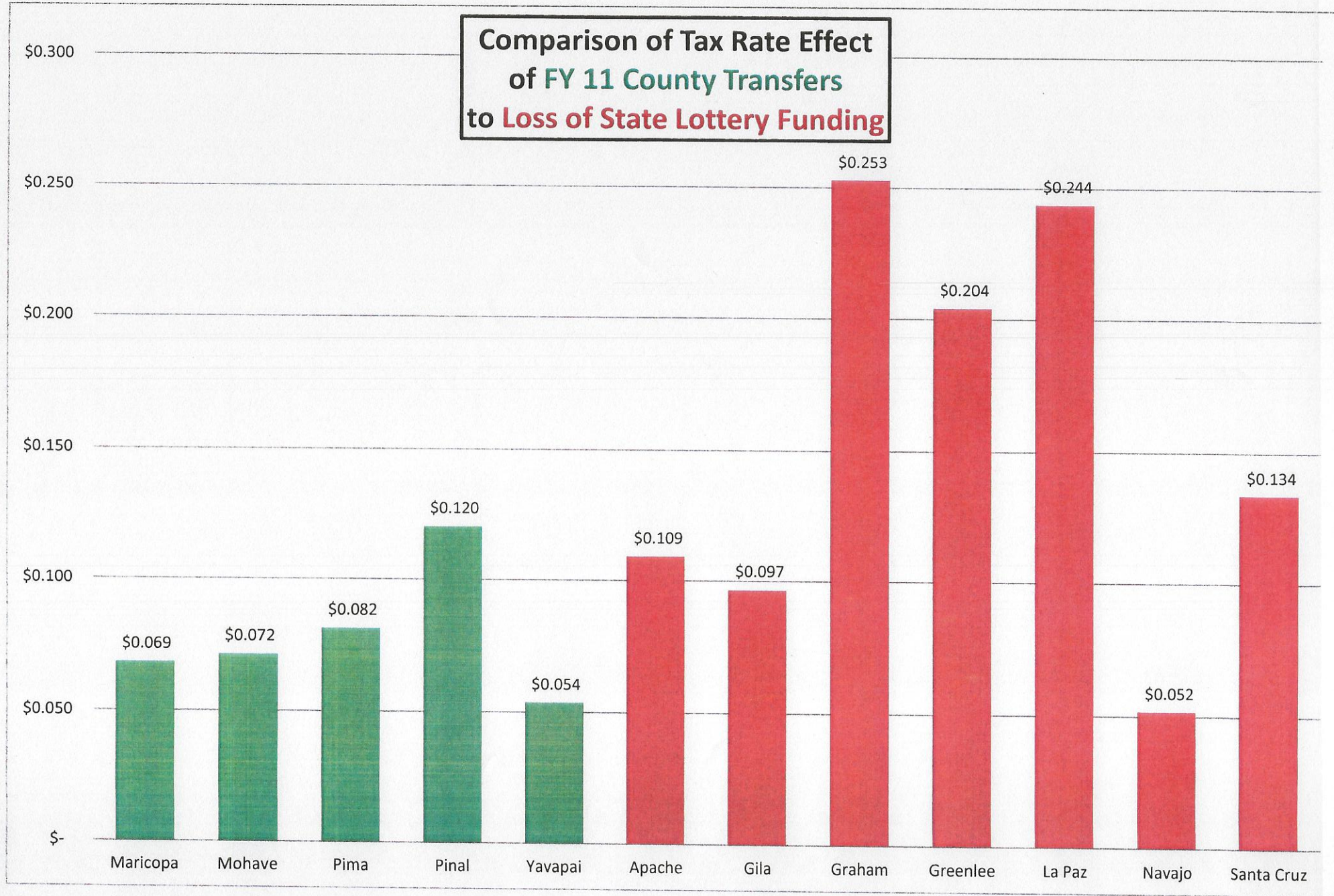
	HURF Shifts To DPS/1	50% of SVP Costs At ASH/2	100% of Rural RTC Costs in State Hospital /3	Reduce State Share of JP Salaries/4	Maricopa Superior Court Judge Salaries	FY11 County Transfers/5	HURF Shift To MVD/6	Inmate Shift/7	ACJC Grants to Indigent Defense/8	Total
Apache	\$618,596	\$36,720	\$0	\$58,616	\$0	\$0	\$0	\$0	\$5,744	\$719,676
Cochise	\$740,250	\$0	\$596,519	\$107,463	\$0	\$0	\$0	\$0	\$11,776	\$1,456,008
Coconino	\$857,022	\$50,405	\$317,383	\$65,594	\$0	\$0	\$0	\$0	\$13,362	\$1,303,766
Gila	\$342,221	\$0	\$383,812	\$37,682	\$0	\$0	\$0	\$0	\$7,287	\$771,002
Graham	\$217,826	\$0	\$57,706	\$33,495	\$0	\$0	\$0	\$0	\$4,979	\$314,006
Greenlee	\$73,107	\$0	\$36,905	\$22,330	\$0	\$0	\$0	\$0	\$1,003	\$133,345
La Paz	\$337,173	\$0	\$47,641	\$54,429	\$0	\$0	\$0	\$0	\$3,067	\$442,310
Maricopa	\$8,491,425	\$3,865,828	\$0	\$0	\$9,012,159	\$26,384,500	\$6,662,102	\$0	\$447,723	\$54,863,737
Mohave	\$1,036,766	\$18,721	\$511,973	\$96,298	\$0	\$1,383,700	\$813,413	\$0	\$20,671	\$3,881,542
Navajo	\$746,317	\$88,394	\$354,288	\$99,089	\$0	\$0	\$0	\$0	\$13,131	\$1,301,219
Pima	\$3,799,058	\$1,217,566	\$53,009	\$243,897	\$0	\$6,775,700	\$2,980,620	\$0	\$88,346	\$15,158,196
Pinal	\$1,388,137	\$342,145	\$666,974	\$138,167	\$0	\$2,597,400	\$1,089,088	\$0	\$29,269	\$6,251,180
Santa Cruz	\$272,364	\$99,280	\$378,444	\$30,704	\$0	\$0	\$0	\$0	\$4,210	\$785,002
Yavapai	\$992,791	\$551,149	\$1,339,987	\$92,111	\$0	\$1,458,700	\$778,912	\$0	\$28,955	\$5,242,605
Yuma	\$979,537	\$0	\$425,414	\$52,986	\$0	\$0	\$0	\$0	\$20,777	\$1,478,714
<b>Total</b>	<b>\$20,892,590</b>	<b>\$6,270,208</b>	<b>\$5,170,055</b>	<b>\$1,132,861</b>	<b>\$9,012,159</b>	<b>\$38,600,000</b>	<b>\$12,324,135</b>	<b>\$0</b>	<b>\$700,300</b>	<b>\$94,102,308</b>

\* Analysis does not include ongoing impacts caused by the FY11 elimination of the County Assistance Fund (CAF) or Prop. 204 Hold Harmless funding. CAF allocated lottery revenues of \$550,035/year to rural counties, \$249,772/year to urban counties.

- 1 - In FY12, the baseline budget includes a shift of \$13.1 million. The Executive and Senate proposals would increase the county impact by \$7.8 million.
- 2 - Continues FY11 session law and increases the required amount counties must pay related to housing prisoners in the Arizona Community Protection and Treatment Center (AzCPTC) from 25% to 50%. Based on actual billings as of October 2010. Actual charges will vary depending on caseload.
- 3 - Based on actual case billings from FY10. Estimates assume FY12 charges will be the same, actual charges will vary depending on caseload.
- 4 - Starting in FY11, the state share of Justice of the Peace salaries is permanently lowered from 38.5% to 19.25%.
- 5 - Beginning in FY09, state budgets have included county transfers from Maricopa and Pima counties. The FY12 Executive's budget proposal included a county transfer of \$21 million. The House budget increases the county transfer to a total of \$38.6, spread across five counties.
- 6 - Proposal shifts \$86 million of HURF to fund MVD, costing counties \$12.3 million in diverted HURF revenues. Rural counties are exempt from funding the MVD.
- 7 - Senate budget proposes shifting DOC inmates serving a prison sentence of less than one year to county. Implementation to begin July 1, 2012.
- 8 - Per SB 1398, ACJC Grants to Indigent Defense are diverted to fund GIITEM for one year.



Comparison of Tax Rate Effect  
of FY 11 County Transfers  
to Loss of State Lottery Funding





ROADWAY NEEDS ASSESSMENT

YEAR 2008

LIMA & ASSOCIATES

<u>Lifecycle Annual Maintenance (Lima &amp; assoc.)</u>	<u>Annual Cost</u>
Rural Paved Road (Less than 5,000' elevation)	\$ 12,030
Rural Paved Road (Greater than 5,000' elevation)	\$ 19,110
Rural Unpaved Road (Less than 5,000' elevation)	\$ 4,910
Rural unpaved Road (Greater than 5,000' elevation)	\$ 12,470

<u>Roads Maintained (2008)</u>	<u>Road Miles</u>	<u>Maintenance Cost</u>	<u>Average Cost Per Mile</u>
Apache	1,695	23,524,600	13,878.82
Gila	669	6,755,600	10,098.06
Graham	732	5,475,400	7,480.05
Greenlee	282	1,721,600	6,104.96
La Paz	964	7,359,200	7,634.02
Navajo	727	11,849,200	16,298.76
Santa Cruz	730	5,987,600	8,202.19
Total	5,799	62,673,200	10,807.59

	<u>Maintenance Cost</u>	<u>Road Revenue</u>	<u>Deficiency</u>
Apache	23,524,600	\$ 8,057,200	(66%)
Gila	6,755,600	\$ 4,547,372	(33%)
Graham	5,475,400	\$ 3,887,676	(29%)
Greenlee	1,721,600	\$ 800,000	(54%)
La Paz	7,359,200	\$ 3,180,000	(57%)
Navajo	11,849,200	\$ 8,717,381	(26%)
Santa Cruz	5,987,600	\$ 3,079,300	(49%)
Total	62,673,200	32,268,929	(49%)



# HURF SHIFT TO DPS

	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>Total</u>
Apache	\$ 421,636	\$ 386,063	\$ 389,380	\$ 618,596	\$ 618,596	\$ 2,434,271
Gila	\$ 233,258	\$ 213,578	\$ 215,413	\$ 342,221	\$ 342,221	\$ 1,346,691
Graham	\$ 148,470	\$ 135,944	\$ 137,112	\$ 217,826	\$ 217,826	\$ 857,178
Greenlee	\$ 49,830	\$ 45,626	\$ 46,018	\$ 73,107	\$ 73,107	\$ 287,688
La Paz	\$ 229,817	\$ 210,428	\$ 212,236	\$ 337,173	\$ 337,173	\$ 1,326,827
Navajo	\$ 508,690	\$ 465,773	\$ 469,774	\$ 746,317	\$ 746,317	\$ 2,936,871
Santa Cruz	\$ 185,644	\$ 169,981	\$ 171,441	\$ 272,364	\$ 272,364	\$ 1,071,794
Total	<u>\$ 1,777,345</u>	<u>\$ 1,627,393</u>	<u>\$ 1,641,374</u>	<u>\$ 2,607,604</u>	<u>\$ 2,607,604</u>	<u>\$ 10,261,320</u>

	<u>Total Revenue Withheld</u>	<u>Deferred Maintenance Factor</u>	<u>True Economic Loss</u>
Apache	\$ 2,434,271	6	\$ 14,605,626
Gila	\$ 1,346,691	6	\$ 8,080,146
Graham	\$ 857,178	6	\$ 5,143,068
Greenlee	\$ 287,688	6	\$ 1,726,128
La Paz	\$ 1,326,827	6	\$ 7,960,962
Navajo	\$ 2,936,871	6	\$ 17,621,226
Santa Cruz	\$ 1,071,794	6	\$ 6,430,764
Total	<u>\$ 10,261,320</u>	<u>6</u>	<u>\$ 61,567,920</u>



# Pavement Preservation

"Every \$1 spent in keeping a good road good precludes spending \$6-\$14 to rebuild one that has deteriorated."



Now



Later

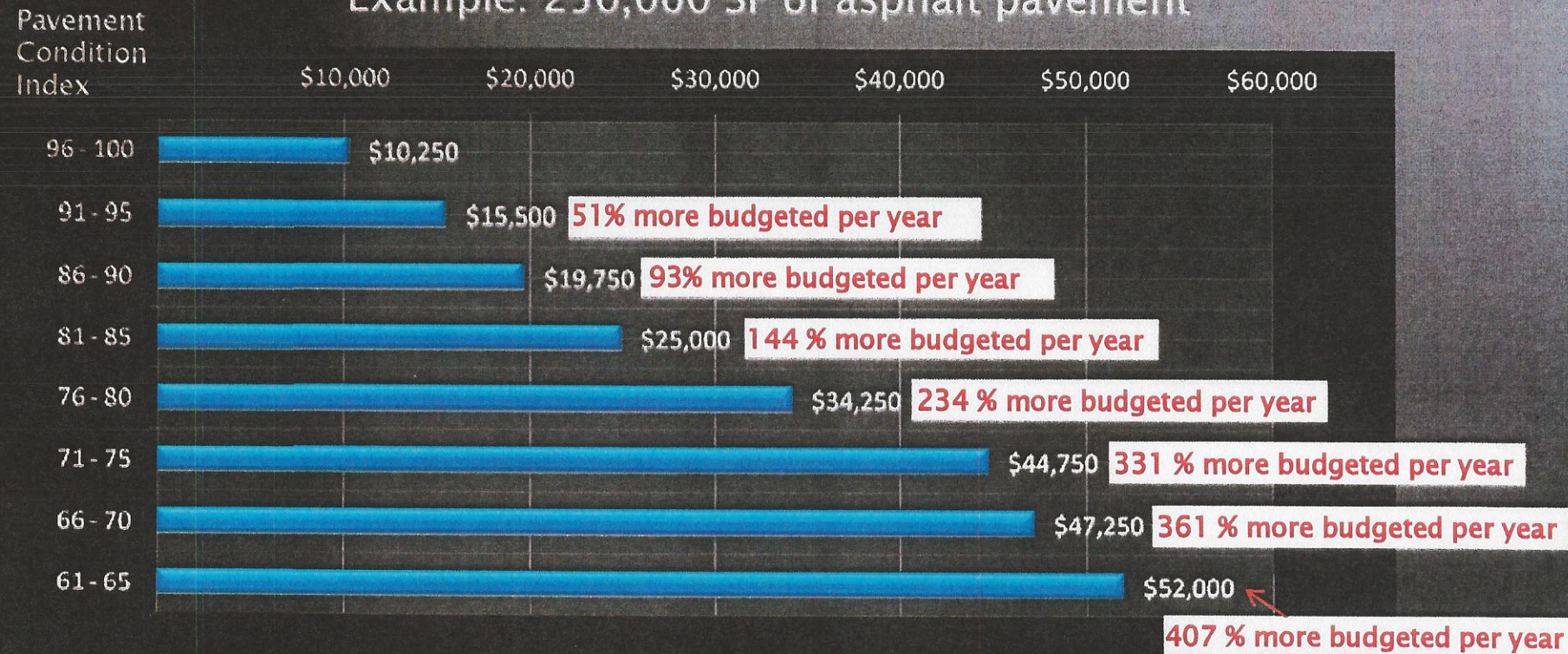
Source:

American Association  
of State Highway and  
Transportation Officials 28



# Cost of Deferred Maintenance

Example: 250,000 SF of asphalt pavement







## **#1 Convenience Fees & Credit/Debit Cards** *(Mohave County)*

### **Proposal:**

As submitted, the proposal would allow county governments to charge a convenience fee to credit or debit card holders.

---

### **Background:**

In 2008, counties were permitted to accept credit and debit cards for payment. Included in the amendment was permission for counties to collect fees to recoup the associated banking fees “unless the charging entity determines that the financial benefits of accepting credit cards or debit cards exceeds the additional processing fees.”

The proposal seeks to prohibit the card processing contracts that prohibit government entities from charging a convenience fee when a credit or debit transaction takes place, in a face-to-face setting. Currently, local governments are unable to charge a convenience fee for those individuals who appear in county offices and conduct their business in person. They are only allowed to charge a convenience fee for transactions occurring over a computer system or via a voice-prompted telephone system. If the measure fails to pass and a county wishes to not absorb the transaction costs, their recourse is to not accept credit or debit cards in their offices.

Representatives of the Arizona Banking Association are reviewing the proposal. They expressed some preliminary concerns on whether or not the ability to hamper with the processors contract may be in violation of some provisions in the federal Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010.

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### **Fiscal Impact:**

If the prohibition is legal, the fiscal impact to each county depends on the number of credit/debit transactions that occur annually which are currently not subject to a convenience fee.





**#2 County Highways**  
*(Mohave County)*

**Proposal:**

Amend statute to accurately define “county highways,” redefine “maintenance” of roadways and to expand the use of the primitive road statute and to remove references of any “recommendations” by county engineers.

---

**Background:**

Statute governing county roadways has been reviewed by the Arizona County Engineers Association and they have identified different sections of statute for “clean-up.” Among some of the sections identified are those that deal with expansion of the roads which can be considered “primitive,” statutes that refer to engineer recommendations and the process by which a county highway is adopted.

The incomplete definition of “county highways” and potentially confusing procedural provisions in statute have caused consternation to some county employees, and this proposal seeks to – at least in part – clarify those provisions.

---

**Fiscal Impact:**

There is not fiscal impact to the counties or the state resulting from this measure.





### **#3 Fire Code Repeal** *(Yuma County)*

**Proposal:**

Permits county boards of supervisors to repeal an adopted fire code that was previously adopted by that board.

---

**Background:**

Current statute permits a county board of supervisors to adopt a fire prevention code in an unincorporated area of the county in which a fire district has not adopted a nationally recognized fire code. The section requires that once the code is adopted the fire code shall remain in effect until a fire district is established and adopts a new code. Most counties and municipalities in Arizona have adopted a version of the International Fire Code (IFC). The IFC specifies regulations to safeguard life and property from fires and explosion hazards and is updated every three years.

The proposed statutory change gives counties the flexibility to change an adopted fire code when necessary, without having to wait for the creation of a fire district. The motive behind this proposed change is that in certain counties, such as Yuma, fire districts are limited in number and once a fire code is adopted, it can never be replaced with a more effective alternative code if the original code is found to be problematic.

The Department of Fire, Building and Life Safety is reviewing the proposal and state statute prior to providing us with feedback.

The Arizona Fire District Association and the Arizona Fire Chiefs Association are reviewing the proposal in depth, although initially they don't perceive a problem with the proposal.

---

**Fiscal Impact:**

There is no discernible fiscal impact to either the counties or the state.





## **#4 Protecting Private E-mail Addresses** *(Yuma County)*

### **Proposal:**

Amends public records law to prevent a private citizen's e-mail address from being included in public records requests.

---

### **Background:**

Current statute prohibits government entities, including counties, from protecting private citizens email addresses (or any other identifying information, such as names or physical addresses) when disclosing e-mails during a public records request.

The proposed statutory change enables counties to redact personal e-mail addresses of citizens within e-mail communications between county elected officials and staff. The motive behind this proposed change is to protect the privacy of residents who request information from county elected officials and staff via email. This proposal mimics a newly passed law in Nevada.

The Arizona Ombudsman's Office's preliminary response cited existing case law to support their position that this proposal would violate public records law. They believe that communication between public entities (and subdivisions) and members of the public are subject to disclosure and review. Existing case law in Arizona has determined that public records are presumptively subject to disclosure unless covered by a statutory exception.

The Arizona Newspaper Association (ANA) expressed numerous concerns about this proposal. The ANA argued this type of legislation enables confidential exchanges between the public and elected officers. Additionally, they argue that this is a "first amendment" issue and that when an individual corresponds with an elected official or public staff, there is no expectation of privacy. Finally, the association believes that information that is not relevant to a public records request may be redacted from those requests to protect a citizen's privacy and that requests centering on commercial nature (*e.g.*, data-mining) may be refused by a government.

In recent years, state legislators have attempted to protect the privacy of those who correspond with state legislators. Those measures have repeatedly failed at the legislature, being opposed by a coalition of "transparency" advocates, including the ANA, the Arizona Ombudsman's Office and the Goldwater Institute.

---

### **Fiscal Impact:**

There is no discernible fiscal impact to either the counties or the state.





**#5 County Road Abandonment by Public Vote**  
*(Cochise County)*

**Proposal:**

Eliminate the requirement that a majority of property owners abutting a roadway approve the board's decision to abandon the roadway.

---

**Background:**

In 2012, the legislature amended state statute to require a majority of property owners abutting a roadway must vote to approve the board's decision to abandon that roadway.

Reportedly, the concern was the effect of the abandonment on the financing of the property owners, due to "recent" disclosures that the federal government would no longer purchase mortgages on properties whose adjacent roadways lacked a maintenance schedule via a political subdivision or other special district entity. Currently, Freddie Mac and Fannie Mae secure about two-thirds of the nation's thirty-year mortgages.

After being held in the House, the measure was revived as a strike-everything amendment late in the session. CSA's Legislative Policy Committee indicated at the time that, while we were opposed to the measure, there were higher priorities facing the organization in the form of retirement issues, regulatory reform issues and other county issues requiring staff and supervisors' time and energy.

*SB 1040 NOW: county highways; county engineer recommendations* was signed by Governor Brewer on April 18, 2012 largely at the behest of Senator Griffin.

---

**Fiscal Impact:**

There is no fiscal impact to the counties or the state resulting from this measure.





## **#6 County Roads & Primitive Roads** *(Cochise County)*

### **Proposal:**

Expand the universe of road systems that are eligible to be brought into the county roadway system and expand the number of roads that are eligible to be declared as “primitive” by a county board to include those opened prior to 1990 (from 1985).

---

### **Background:**

Counties have been historically constrained to accepting roadways into the county roadway system maintenance plan to those roads built to standards, which are part of an approved subdivision.

In some circumstances, there have been roadways in unincorporated areas that the county and private interests were interested in bringing into the county maintenance schedule. Statutory wording made the ability to adopt the road cumbersome. Currently, there are roadways associated with mining activities that - once brought to county standard by the private sector - the county would like to bring into the county maintenance schedule. While current economic circumstances make the enhancement of the roads questionable, the parties are seeking this legislative change in the hopes that an economic recovery will permit the road enhancements to take place and the roads to be transferred to the county for maintenance.

The amendment to the “Primitive Road” statute is a conforming change to a bill from last session to authorize county money to be spent on roadways opened prior to 1990.

---

### **Fiscal Impact:**

There is no fiscal impact to the counties or the state resulting from this measure.





## **#7 Cannabis is Not a Crop** *(Yavapai County)*

### **Proposal:**

Excludes cannabis from the definition of “general agricultural purposes,” in statute, thus subjecting the cultivation of medical marijuana to greater county zoning.

---

### **Background:**

In November 2010, voters in Arizona passed Proposition 203, the Medical Marijuana Act (Act). The Act permits a patient who has a debilitating medical condition to obtain a defined amount of marijuana from a nonprofit medical marijuana dispensary and to use and possess the marijuana.

Current statute requires cultivation of marijuana to take place in an enclosed, locked facility at a physical address provided to the Arizona Healthcare Cost Containment System (AHCCCS) during the registration process, by registered nonprofit medical marijuana dispensary agents. Further, a marijuana dispensary is permitted to acquire marijuana or marijuana plants from a registered patient or registered caregiver, provided those individuals receive no financial compensation for the marijuana.

The proposed statutory change would give individual counties the ability to subject any marijuana cultivation operation to county zoning ordinances. Though current statute permits counties, cities and towns to enact zoning restrictions regarding marijuana dispensaries, it does not permit them to regulate the zoning of the marijuana cultivation sites. Currently, marijuana may only be grown in a closed and locked facility (such as a greenhouse) and comply with local zoning ordinances – and arguably be defined as an agricultural product under existing statute, ARS §11-812.

The motive behind this proposed change is to prevent the possible creation of marijuana “co-ops” on commercial land. A “co-op” of this nature would be defined as a group of qualified patients, qualified caregivers and dispensary operators who all grew their specified number of plants in the same location. A “co-op” of this nature already exists in Maricopa County.

A folder has already been opened by the Senate President for this legislation.

The Arizona Department of Health Services preliminary response was that this proposal would further the intent of the original ballot initiative which gave counties, cities and towns the flexibility to limit the zoning of the dispensaries.

Additional stakeholders, including the Arizona Medical Marijuana Association, are reviewing the proposal for feedback.

---

### **Fiscal Impact:**

There is not a fiscal impact associated with the proposal.





## **#8 Utilities in the County Rights of Way** *(Pinal County)*

### **Proposal:**

Grant counties authority to charge fees to all utilities using county rights of way, similar to municipal and existing county authority for telecommunications utilities.

---

### **Background:**

Currently, counties may only charge telecommunication utilities a fee for using county rights of way. Municipalities have the power to charge all utilities a fee for use of rights of way. This fee, commonly referred to as a "franchise fee," compensates the municipalities for any damage, subpar repairs, and accelerated degradation of publically owned infrastructure.

The proposed statutory change gives individual counties the ability to charge a franchise fee to a utility, just as a municipality would, for using a county's right of way. Utilities create issues for agencies responsible for maintaining roads when there is a breakage in an underground utility that requires the utility to tear up pavement in order to make repairs or upgrades to the utility. The resulting patching of the infrastructure after such work by the utility is often inferior to the surrounding surface and can decrease the lifespan of the publicly owned infrastructure.

The ability to charge utilities a franchise fee will allow a county to negotiate price with the utility that will compensate the county for any negative impacts from the utility. However, in some rural areas the utilities may argue that a franchise fee attached to the cost of providing services to a sparse population will become prohibitive for the utility.

---

### **Fiscal Impact:**

There is no anticipated fiscal impact to the state budget. Each county would negotiate their own franchise fee with utilities, as franchises are established or renewed.





## **#9 Annexations of Rights of Way** *(Pinal County)*

### **Proposal:**

Amends annexation processes to permit simple transfers of ownership of roadway and rights of way by mutual consent, avoiding technical requirement and property owners' consent and petition process.

---

### **Background:**

Current statute allows for the annexation of a right of way or roadway by a city or town by mutual consent of the governing bodies of both the county and city or town if property is adjacent to the city or town. However, the use of the word "annexation" requires that certain size restrictions apply and requires the width of the property to be at least 200 ft. and a 2:1 length to width ratio.

The proposed statutory change gives counties along with cities and towns the ability to mutually agree on a transfer of a right of way or road that does not meet the size requirements of an annexation. If a city or town desires a certain right of way be transferred from the county but the right of way's width is less than 200 ft., as many are, then the 200 ft. requirement will usually push the area onto private property and require a petition of the property owners. This proposal will allow a transfer, agreed to by both the county and city or town, to take place regardless of the size.

While the counties currently have this ability to transfer property of the right statutory size, this proposal may bring criticism for a lack of property owner input.

---

### **Fiscal Impact:**

There is no anticipated fiscal impact to either the state or a county's budget.





## **#11 Child Support Collections** *(Navajo County)*

### **Proposal:**

Restore the ability to use State Shared Retained Earnings (SSRE) as matching funds from the federal level and protect against the state forcing an unfunded collection mandate to the county level.

---

### **Background:**

The Social Security Act, Title IV-D (Title IV-D) mandated that states enforce child support collections. The administration of this program varies across the country, Arizona uses a hybrid approach where the state (through the Department of Economic Security (DES)) handles the majority of child support collections and four counties handle their own collections (La Paz, Gila, Navajo and Pinal counties).

Currently Title IV-D requires the federal government to reimburse all states 66% of all monies spent by the states (and counties) to provide child support services. When Title IV-D was first enacted states and counties, were allowed to earn the balance of 34% of expenses, the matching funds, by performing above set performance levels. These funds were referred to as State Shared Retained Earnings (SSRE). The ability to use SSRE monies for the match enabled child support offices to be entirely self-sufficient. The amount of collected SSRE has been negatively affected by federal legislation in recent years resulting in an expected annual loss of \$4.5 million of SSRE, as well as a further loss of \$9.0 million in matching federal Title IV-D funds.

Although the 2009 American Recovery and Reinvestment Act enabled child support offices to temporarily use SSRE funds to cover their lost matching dollars, currently counties are prohibited from using SSRE monies to cover their matching funds.

This proposal would allow county child support offices to be self-sufficient and not reliant on their general funds for program funding. There is also the possibility that the state (in an attempt to save money) might consider passing on unfunded child support responsibilities to the counties that do not currently administer their own programs.

DES indicated that the perception in Washington, D.C. was that the matching fund of the SSRE was a "double dip" into federal dollars and described the program as intended as a performance incentive for local governments. While they have faced funding difficulties in recent years, there is an active piece of federal legislation, with bipartisan support, that reinstates federal matching of state spending of child support incentive payments.

The National Association of Counties (NACo) Human Services and Education Steering Committee passed a resolution that had been submitted by Navajo County to support this issue of restoration of the ability to use matching SSRE funds.

---

### **Fiscal Impact:**

For the county administered programs, it appears to be positive, though it would vary from county to county. The state program was forced to turn to general fund appropriations in recent years to continue to fund this program. By enabling the state to access these funds, DES could see a restoration of a large portion of their operating budget.





**#12 County Assistance Fund**  
*(Navajo County)*

**Proposal:**

Restore County Assistance Fund lottery dollars to their historic level for every county, as part of CSA's "budget priorities" for 2013.

---

**Background:**

In FY2011 the State Legislature eliminated the County Assistance Fund as a recipient for Lottery revenues. The County Assistance Fund was eliminated as part of an effort to free up as much of the lottery revenue as possible in order to secure a \$450,000,000 revenue bond to fund the State General Fund.

Prior to FY2011, the County Assistance Fund received \$7,650,000 with \$550,035 going to each of the 13 smaller counties and \$249,772 going to both Maricopa and Pima counties.

For FY2013, \$37.5 million is allocated for debt service payments on the lottery bond and JLBC estimates that lottery revenues will total \$150.6 million with \$57.6 million going to the State General Fund and the rest slotted for other statutory funds.

If there are monies left over after the statutory dispersions, the State General Fund will receive the remainder. Current JLBC forecasts for the Lottery revenue fall about \$2 million short of fully funding all Lottery recipients.

---

**Fiscal Impact:**

The fiscal impact will be a positive one for Arizona counties.





**#13 Half-Cent Sales Tax**  
*(Navajo County)*

**Proposal:**

Increase current levy authority for the smaller fourteen counties to levy a sales tax from one-half cent per dollar to one-cent per dollar by a unanimous vote of the board of supervisors.

---

**Background:**

Currently, Arizona counties are allowed to levy a sales tax of up to one-half cent per dollar, except Maricopa County. Most counties, except Pima County, have levied the sales-tax via a unanimous vote of their board. Of those enacting the measure, all the counties have enacted the full one-half cent amount except for Mohave County, which levied a one-quarter of one cent sales tax per dollar.

The effect of the economic downturn on county revenues and the impacts from administrative responsibilities shifted to the counties over the last five years has created a situation that cannot be sustained at current revenue levels for some, if not most, counties.

Property tax values continue to decline across many counties, while increased costs in various aspects of county government and employee related expenses point to the need for increased revenue options for counties that are facing untenable fiscal constraints on their budgets.

The shift of responsibilities, the reduction in current resources due to the Great Recession, and the constitutional levy limits on property taxes force counties to seek additional revenue via the sales tax at the county level.

This proposal would give a board of supervisors the authority to levy the sales tax of up to one-full-cent per dollar.

---

**Fiscal Impact:**

The fiscal impact will vary from county to county based on multiple factors. There is no discernible state budgetary impact.





# Introduction and Background

- Transaction privilege tax is imposed the business of prime contracting.
- “Prime contracting” means engaging in business as a prime contractor.
- “Prime contractor” means a contractor who supervises, performs or coordinates the modification of any building, highway, road, railroad, excavation, manufactured building or other structure, project, development or improvement and who is responsible for the completion of the project.





# Tax Base

- The tax base for the prime contracting classification is sixty-five percent (65%) of the gross proceeds of sales or the gross income from the business
- Construction Phase/Design Phase
  - Separate written contract – design phase services not subject to tax



Table 15

**GEOGRAPHICAL DISTRIBUTION OF BUSINESS INCOME  
PROVIDED DIRECTLY BY THE ARIZONA COPPER INDUSTRY  
2010**

Region	Copper Industry Purchases of Products and Services
Phoenix Metropolitan Area (a) .....	\$1,155,557,000
Tucson Metropolitan Area (b) .....	832,644,000
Non-Metropolitan Mining Counties (c) .....	515,561,000
All Other Counties (d) .....	8,157,000
<b>Arizona Total</b> .....	<b>\$2,511,919,000</b>
<b>Outside of Arizona (e)</b> .....	<b>1,024,999,000</b>
<b>Total Purchases</b> .....	<b>\$3,536,918,000</b>

(a) Maricopa County

(b) Pima County

(c) Cochise, Gila, Graham, Greenlee, Mohave, Pinal, and Yavapai counties.

(d) Apache, Coconino, La Paz, Navajo, Santa Cruz, and Yuma counties.

(e) Includes only purchases of products and services made by Arizona copper producers outside of Arizona for use in Arizona. Does not include purchases made by Arizona copper producers outside of Arizona for use outside of Arizona. Such excluded external spending includes such items as smelting and refining charges paid in other states for processing Arizona copper and marketing and administrative expenses incurred outside of Arizona. Included are such items as purchases of equipment, supplies, services, and fuels in other states for use in Arizona.

Source: Western Economic Analysis Center



Table 23

**COUNTY GOVERNMENT REVENUES PROVIDED DIRECTLY  
BY THE ARIZONA COPPER INDUSTRY  
2010**

County	Amount of Revenue
Maricopa .....	\$8,334,500
Pima .....	7,997,300
Greenlee .....	4,220,300
Pinal .....	3,176,400
Gila .....	2,496,000
Yavapai .....	1,986,900
Mohave .....	1,684,900
Graham .....	784,300
Cochise .....	620,500
Yuma .....	352,700
Coconino .....	240,200
Navajo .....	216,000
Apache .....	90,100
Santa Cruz .....	83,900
La Paz .....	39,900
<b>Total .....</b>	<b>\$32,323,900</b>

The above amounts are contributed directly through the property taxes and fees collected by the respective counties and through the automatic apportionment of sales taxes and severance taxes collected by the State of Arizona.

Source: Western Economic Analysis Center



15-1409. Provisional community college districts; formation; governing board; powers and duties; issuance and sale of bonds for capital outlay

A. A provisional community college district shall contract with an existing community college district to provide instructional and student services within the provisional community college district.

B. The minimum assessed valuation and population requirements prescribed in section 15-1402 do not apply to provisional community college districts.

C. A provisional community college district shall be formed and a provisional community college district governing board shall be elected in the same manner prescribed in sections 15-1403, 15-1404 and 15-1441, except that the county board of supervisors by majority vote may adopt a resolution to submit the question of the formation of a provisional community college district and the approval of a proposed tax rate to fund the provisional community college district directly to the qualified electors of the county at a special or general election called for that purpose as prescribed in section 16-204 and title 35, chapter 3, article 3. The resolution adopted by the county board of supervisors shall include a statement that the primary property tax levy limit for the provisional community college district shall be no less than the levy limit of the most recently formed community college district in this state.

D. Except as provided in this section, a provisional community college district governing board has the same powers and duties specified in section 15-1444 for community college districts.

E. A provisional community college district shall not award degrees, certificates or diplomas.

F. A provisional community college district is not eligible to receive equalization aid pursuant to section 15-1468 or state contribution for capital outlay for initial or additional campuses pursuant to section 15-1463.

G. The state aid eligibility requirements prescribed in section 15-1466, subsection E, paragraphs 1 and 2 do not apply to provisional community college districts.

**State Aid as prescribed in section 15-1466 shall be at the same rate for provisional community colleges per full time student equivalent as the existing community college providing the instructional and student services to the provisional community college.**

H. Notwithstanding any other law, the same student shall not be counted twice as a full-time equivalent student in both a provisional community college district and a community college district. Notwithstanding any other law, beginning with the fiscal year after the year in which the provisional community college district is formed and has established its primary tax rate, a district that provides services in a provisional district pursuant to section 15-1470 shall no longer count these students in the district's full-time equivalent student count.

I. If a provisional community college district is converted into a community college district by the formation of a community college district pursuant to section 15-1402 or 15-1402.01, the provisional community college district is dissolved and any equipment, property, personnel, liabilities and assets are transferred to the community college district.



**FY 2012 State Budget**

	<u>Cochise and Santa Cruz</u>
Operating State Aid	\$ 5,572,000
Full Time Student Equivalents	<u>8,586</u>
Operating State Aid/FTSE	<u>\$ 648.96</u>

**FY 2013 State Budget**

	<u>Cochise</u>	<u>Santa Cruz</u>
Operating State Aid	\$ 5,784,600	\$ 63,500
Full Time Student Equivalents	<u>9,511</u>	<u>277</u>
Operating State Aid/FTSE	<u>\$ 608.20</u>	<u>\$ 229.24</u>

	<u>Graham</u>	<u>Gila</u>
Operating State Aid	\$ 2,373,200	\$ 410,000
Full Time Student Equivalents	<u>3,512</u>	<u>964</u>
Operating State Aid/FTSE	<u>\$ 675.74</u>	<u>\$ 425.31</u>

Cost to State	<u>Santa Cruz Revised</u>	<u>Gila Revised</u>	
Full Time Student Equivalents	277	964	
Operating State Aid/FTSE (Contract Comm. College)	<u>\$ 608.20</u>	<u>\$ 675.74</u>	
Operating State Aid	\$ 168,472	\$ 651,414	
State Budget	<u>\$ 63,500</u>	<u>\$ 410,000</u>	
Increase in State Aid	<u><u>\$ 104,972</u></u>	<u><u>\$ 241,414</u></u>	<u><u>\$ 346,385</u></u>